HAZARD RANKING SYSTEM (HRS) DOCUMENTATION RECORD COVER SHEET

Name of Site: Southside Chattanooga Lead Site

EPA ID No.: TNN000410686

Contact Persons

Documentation Record:

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Pathways, Components, or Threats Not Scored

The ground water, surface water, and air migration pathways, as well as the nearby population threat of the soil exposure component and the subsurface intrusion component of the soil exposure and subsurface intrusion pathway were not scored in this Hazard Ranking System (HRS) documentation record because the resident population threat of the soil exposure component of the soil exposure and subsurface intrusion pathway is sufficient to qualify the site for the National Priorities List (NPL). The ground water, surface water, and air migration pathways, and the nearby population threat of the soil exposure component of the soil exposure and subsurface intrusion pathway, are of concern to the U.S. Environmental Protection Agency (EPA) and may be considered during a future evaluation. At the time of the listing, the site score is sufficient without, and the listing of the site would not be changed by, the addition of the threats, components, and pathways mentioned above.

Ground Water Migration Pathway: The listing of the site would not be changed by evaluating this pathway.

Surface Water Migration Pathway: The listing of the site would not be changed by evaluating this pathway.

Nearby Population Threat and Soil Exposure and Subsurface Intrusion Component of the Soil Exposure and Subsurface Intrusion Pathway: The resident population threat of the soil exposure component is adequate to qualify the Southside Chattanooga Lead Site for the NPL; therefore, the nearby population threat was not scored. Lead is the contaminant of concern at the Southside Chattanooga Lead Site; therefore, the subsurface intrusion component is not a concern.

Air Migration Pathway: The listing of the site would not be changed by evaluating this pathway.

HAZARD RANKING SYSTEM (HRS) DOCUMENTATION RECORD

Name of Site:	Southside Chattanooga Lead Site
EPA Region:	4
Date Prepared:	January 2018
Street Address of Site*:	Intersection of East 16th Street and Jefferson Street
City, County, State, Zip:	Chattanooga, Hamilton County, Tennessee 37408
General Location in the State:	Southeastern portion of state
Topographic Maps:	Chattanooga, 1969, Photorevised 1972
Latitude:	35° 01' 57.1872" North
Longitude:	85° 18' 2.0124" West

The coordinates above for the Southside Chattanooga Lead Site were measured from within the area of observed contamination (AOC A) at the intersection of East 16th Street and Jefferson Street in Chattanooga, Tennessee (Ref. 4, pp. 1, 2).

* The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area where the site is located. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, and not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, disposed or placed, or has otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

Pathway	**Pathway Score**
Ground Water[1] Migration	Not Scored
Surface Water Migration	Not Scored
Soil Exposure and Subsurface Intrusion	100.00
Air Migration	Not Scored
HRS SITE SCORE	**50.00**

[1] "Ground water" and "groundwater" are synonymous; the spelling is different due to "ground water" being codified as part of the HRS, while "groundwater" is the modern spelling.

WORKSHEET FOR COMPUTING HRS SITE SCORE

	S Pathway	S^2 Pathway
1. Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13)	NS	NS
2a. Surface Water Overland/Flood Migration Component Score (from Table 4-1, line 30)	NS	NS
2b. Ground Water to Surface Water Migration Component Score (from Table 4-25, line 28)	NS	NS
2c. Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	NS	NS
3a. Soil Exposure Component Score (S_{se}) (from Table 5-1, line 22)	100.00	10,000
3b. Subsurface Intrusion Component Score (S_{ssi}) (from Table 5-11, line 12)	NS	NS
3c. Soil Exposure and Subsurface Intrusion Pathway Score (S_{sessi}) (from Table 5-11, line 13)	100.00	10,000
4. Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	NS	NS
5. Total of $S_{gw}^2 + S_{sw}^2 + S_{sessi}^2 + S_a^2$		2,500
6. HRS Site Score Divide the value on line 5 by 4 and take the square root		**50.00**

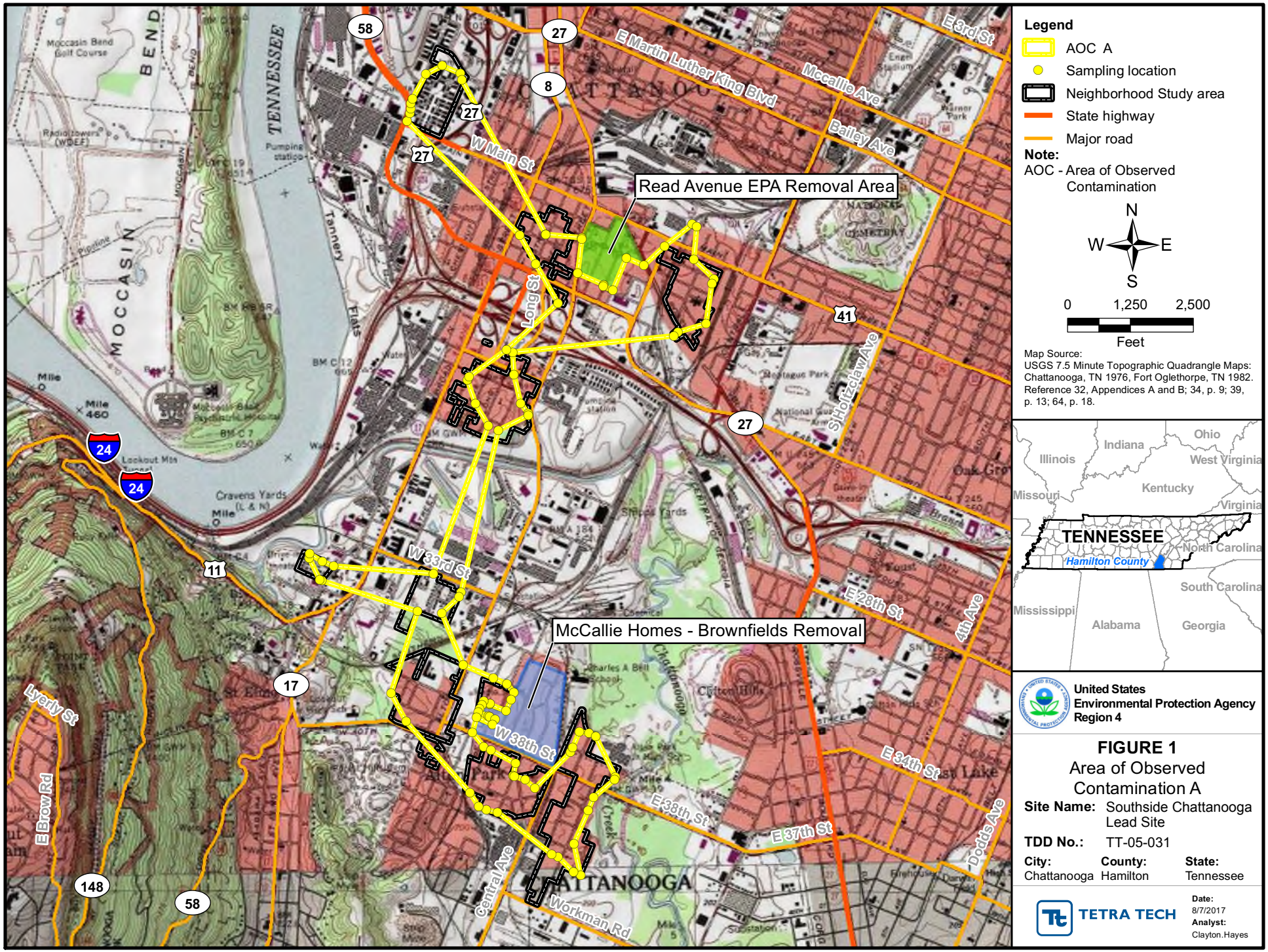
Note:

NS = Not scored

TABLE 5-1 --SOIL EXPOSURE COMPONENT SCORESHEET			
Factor categories and factors	Maximum Value	Value Assigned	
Resident Population Threat			
Likelihood of Exposure:			
1. Likelihood of Exposure	550		550
Waste Characteristics:			
2. Toxicity	(a)	10000	
3. Hazardous Waste Quantity	(a)	10	
4. Waste Characteristics	100		18
Targets:			
5. Resident Individual	50	45	
6. Resident Population:			
6a. Level I Concentrations	(b)	NS	
6b. Level II Concentrations	(b)	1,059. 4	
6c. Population (lines 6a + 6b)	(b)	1,059.4	
7. Workers	15	5	
8. Resources	5	NS	
9. Terrestrial Sensitive Environments	(c)	NS	
10. Targets (lines 5 + 6c + 7 + 8 + 9)	(b)		1,109.4
Resident Population Threat Score			
11. Resident Population Threat Score (lines 1 x 4 x 10)	(b)		10,983,060
Nearby Population Threat			
Likelihood of Exposure:			
12. Attractiveness/Accessibility	100	NS	
13. Area of Contamination	100	NS	
14. Likelihood of Exposure	500	NS	NS
Waste Characteristics:			
15. Toxicity	(a)	NS	
16. Hazardous Waste Quantity	(a)	NS	
17. Waste Characteristics	100		NS
Targets:			
18. Nearby Individual	1	NS	
19. Population Within 1 Mile	(b)	NS	
20. Targets (lines 18 + 19)	(b)		NS
Nearby Population Threat Score:			
21. Nearby Population Threat (lines 14 x 17 x 20)	(b)		NS
Soil Exposure Component Score:			
22. Soil Exposure Component Score [d] (S_{se}), (lines [11+21]/82,500, subject to a maximum of 100)	100.00		100.00

Notes:

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] No specific maximum value applies to factor. However, pathway score based solely on terrestrial sensitive environments is limited to maximum of 60.
[d] Do not round to nearest integer.
NS Not scored



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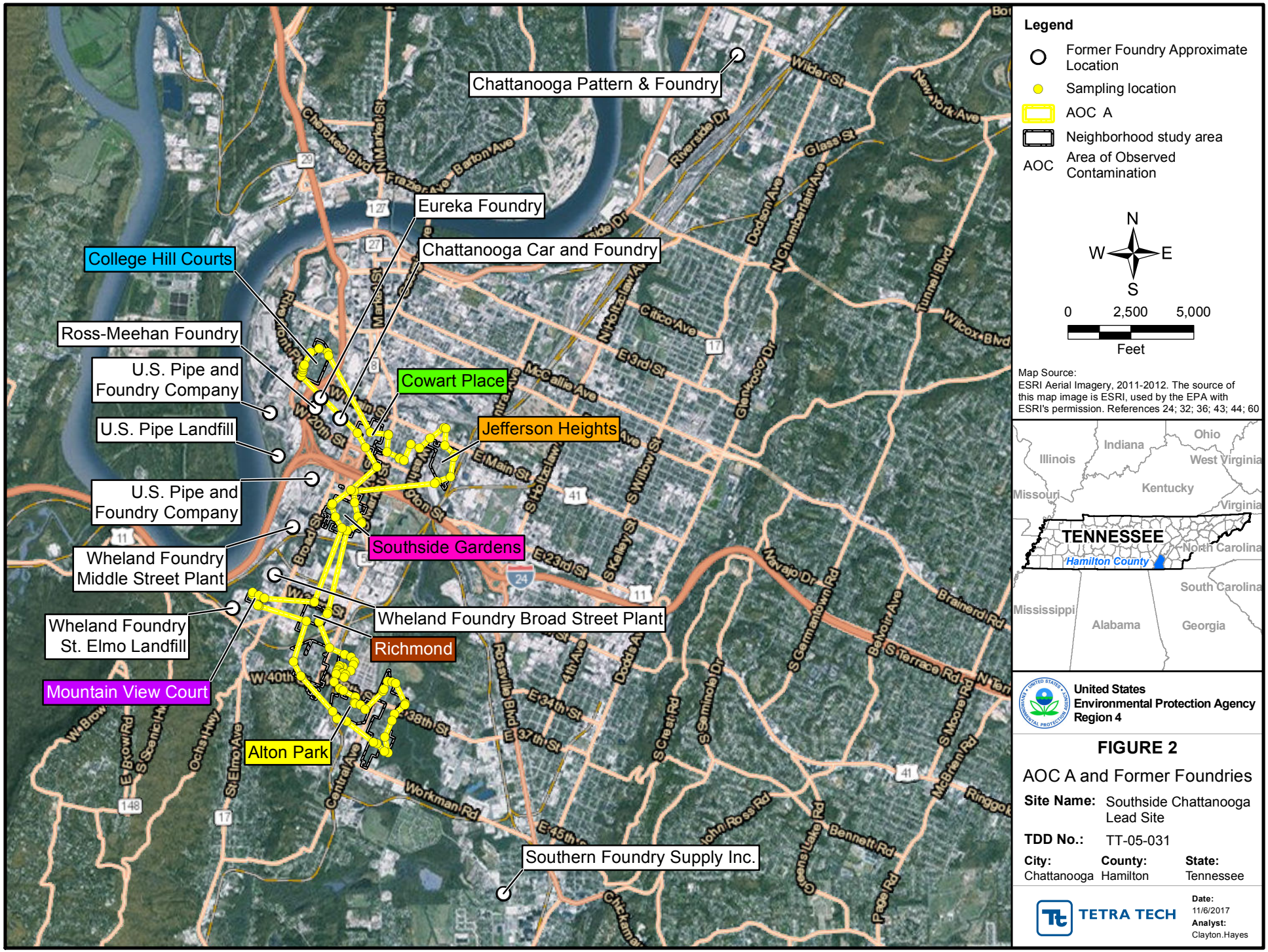
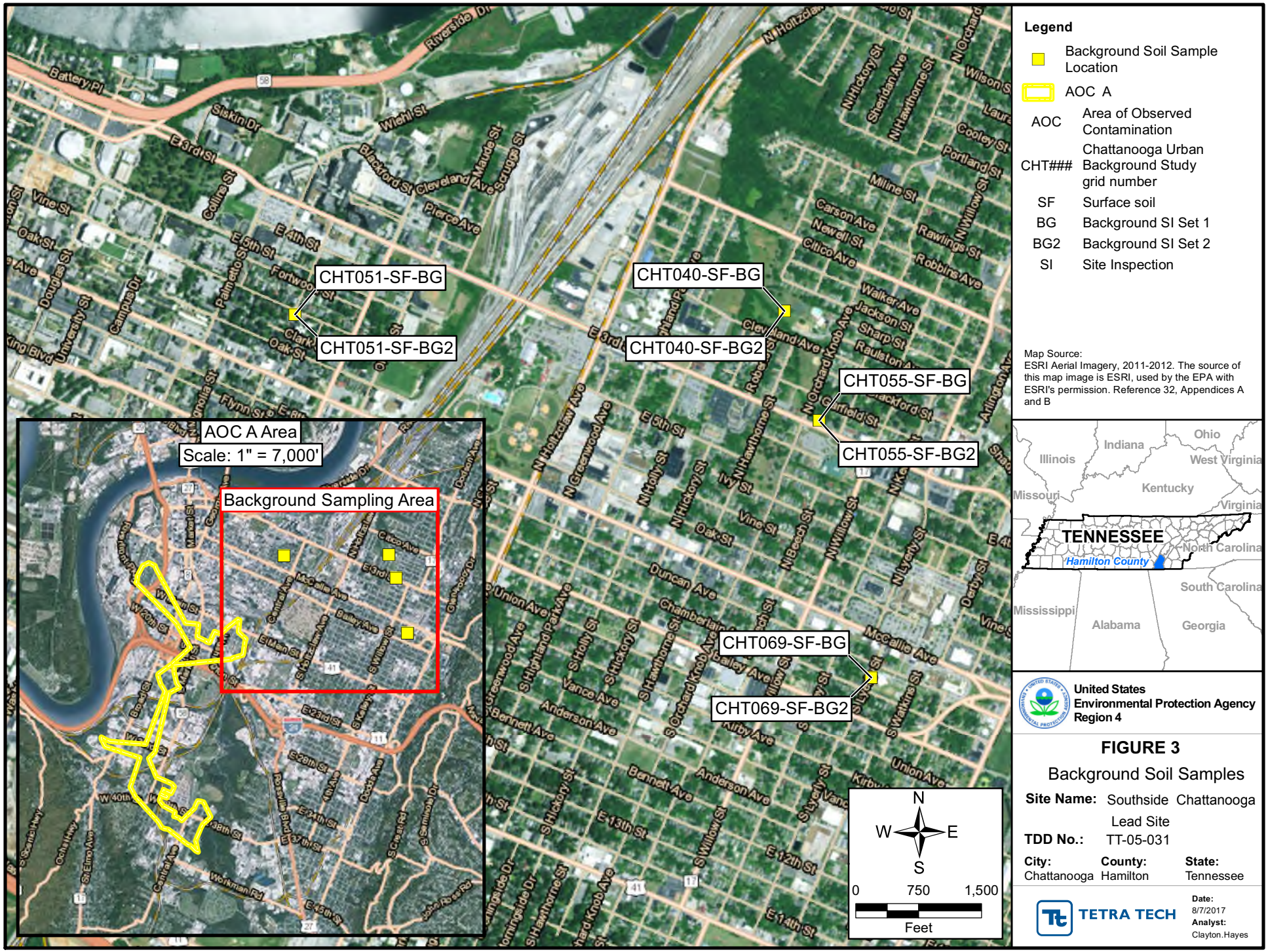
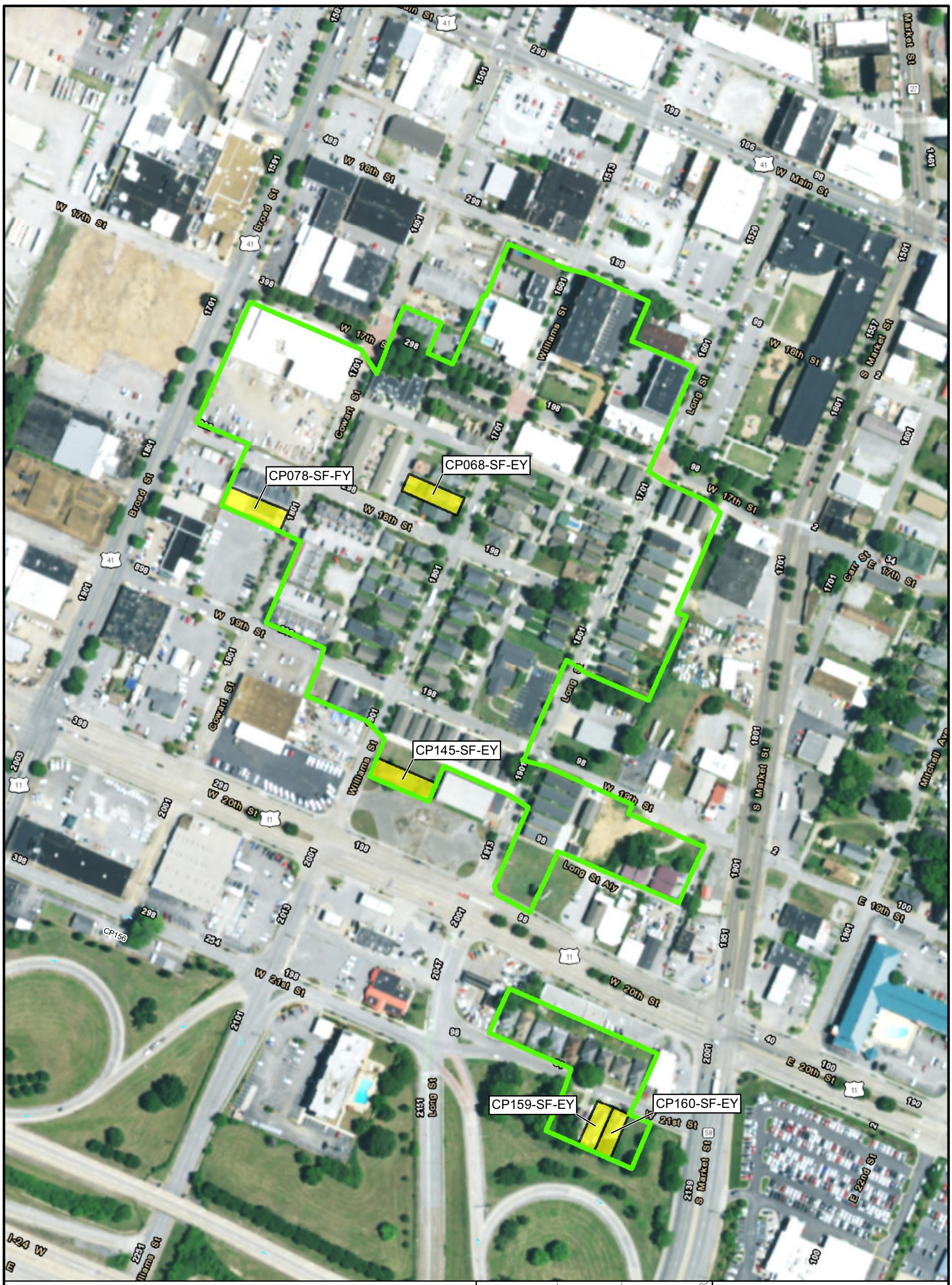

Chattanooga Pattern & Foundry
Eureka Foundry
Chattanooga Car and Foundry
College Hill Courts
Ross-Meehan Foundry
U.S. Pipe and Foundry Company
U.S. Pipe Landfill
U.S. Pipe and Foundry Company
Wheland Foundry Middle Street Plant
Wheland Foundry St. Elmo Landfill
Mountain View Court
Cowart Place
Jefferson Heights
Southside Gardens
Wheland Foundry Broad Street Plant
Richmond
Alton Park
Southern Foundry Supply Inc.
Legend
Former Foundry Approximate Location
Sampling location
AOC A
Neighborhood study area
AOC
Area of Observed Contamination
N
W
E
S
0
2,500
5,000
Feet
Map Source:
ESRI Aerial Imagery, 2011-2012. The source of this map image is ESRI, used by the EPA with ESRI's permission. References 24; 32; 36; 43; 44; 60
Illinois
Indiana
Ohio
West Virginia
Kentucky
Missouri
Virginia
TENNESSEE
North Carolina
Hamilton County
South Carolina
Mississippi
Alabama
Georgia
United States Environmental Protection Agency Region 4
FIGURE 2
AOC A and Former Foundries
Site Name: Southside Chattanooga Lead Site
TDD No.: TT-05-031
City: Chattanooga
County: Hamilton
State: Tennessee
TETRA TECH
Date: 11/6/2017
Analyst: Clayton.Hayes
File: X:\G\9027\05\031\Projects\mxd\Figure2.mxd


CHT051-SF-BG
CHT051-SF-BG2
CHT040-SF-BG
CHT040-SF-BG2
CHT055-SF-BG
CHT055-SF-BG2
CHT069-SF-BG
CHT069-SF-BG2
AOC A Area
Scale: 1" = 7,000'
Background Sampling Area
Legend
Background Soil Sample Location
AOC A
AOC Area of Observed Contamination
CHT### Chattanooga Urban Background Study grid number
SF Surface soil
BG Background SI Set 1
BG2 Background SI Set 2
SI Site Inspection
Map Source:
ESRI Aerial Imagery, 2011-2012. The source of this map image is ESRI, used by the EPA with ESRI's permission. Reference 32, Appendices A and B
Indiana
Ohio
Illinois
West Virginia
Kentucky
Missouri
Virginia
TENNESSEE
Hamilton County
North Carolina
South Carolina
Mississippi
Alabama
Georgia
N
W
E
S
0
750
1,500
Feet
United States Environmental Protection Agency Region 4
FIGURE 3
Background Soil Samples
Site Name: Southside Chattanooga Lead Site
TDD No.: TT-05-031
City: Chattanooga
County: Hamilton
State: Tennessee
TETRA TECH
Date: 8/7/2017
Analyst: Clayton.Hayes
File: X:\G\9027\05\031\Projects\mxd\Figure3.mxd


CP078-SF-FY
CP068-SF-EY
CP145-SF-EY
CP159-SF-EY
CP160-SF-EY
CP156
W 16th St
W 17th St
W 18th St
W 19th St
W 20th St
W 21st St
W Main St
Broad St
Cowart St
Williams St
Long St
Long St Aly
S Market St
Market St
E 17th St
E 19th St
E 20th St
E 22nd St
Carr St
Mitchell Ave
I-24 W
Legend
Cowart Place
Area of Observed Contamination and Level II Parcel
CP### Project-specifc Property Number
EY Entire Yard
FY Front Yard
SF Surface Soil
N
W
E
S
0
100
200
Feet
Map Source:
ESRI Aerial Imagery, 2011-2012. The source of this map image is ESRI, used by the EPA with ESRI's permission.
Reference 32, Appendices A and B
Ohio
Indiana
Illinois
West Virginia
Kentucky
Missouri
Virginia
TENNESSEE
Arkansas
Hamilton County
North Carolina
South Carolina
Mississippi
Alabama
Georgia
United States
Environmental Protection Agency
Region 4
FIGURE 4
Cowart Place
Area of Observed Contamination
Site Name: Southside Chattanooga Lead Site
TDD No.: TT-05-031
City: Chattanooga
County: Hamilton
State: Tennessee
TETRA TECH
Date: 8/7/2017
Analyst: Clayton.Hayes
File: X:\G\9027\05\031\Projects\mxd\Figure4.mxd

JH171-SF-FY
JH171-SF-BY
JH170
JH019
JH020-SF-EY
JH018-SF-EY
JH018-SF-EY-DUP
JH017-SF-EY
JH016-SF-EY
JH021-SF-EY
JH015-SF-BY
JH031-SF-EY
JH033-SF-EY
JH024-SF-EY
JH063-SF-EY
JH023
JH036-SF-EY
JH062-SF-EY
JH037-SF-EY
JH064-SF-EY
JH064-SF-EY-DUP
JH061-SF-EY
JH038-SF-EY
JH039-SF-EY
JH060-SF-EY
JH060-SF-EY-DUP
JH060-SF-GD
JH059-SF-BY
JH052-SF-EY
JH041
JH048-SF-EY
JH069-SF-EY
JH049-SF-BY
JH055-SF-EY
JH053-SF-EY
JH109-SF-EY
JH097-SF-EY
JH167-SF-EY
N
W
E
S
0
100
200
Feet

Legend

	Jefferson Heights
	Area of Observed Contamination
	Area of Observed Contamination and Level II Parcel
	Removal Parcel
JH###	Project-specific Property Number
BY	Backyard
DUP	Dupilcate
EY	Entire Yard
FY	Front Yard
GD	Garden
SF	Surface Soil

Map Source:
ESRI Aerial Imagery, 2011-2012. The source of this map image is ESRI, used by the EPA with ESRI's permission.
References 32, Appendices A and B

United States
Environmental Protection Agency
Region 4

FIGURE 5

Jefferson Heights
Area of Observed Contamination

Site Name: Southside Chattanooga Lead Site

TDD No.: TT-05-031

City:	County:	State:
Chattanooga	Hamilton	Tennessee

TETRA TECH

Date: 8/7/2017
Analyst: Clayton.Hayes

File: X:\G\9027\05\031\Projects\mxd\Figure5.mxd

SG002-SF-EY
SG012-SF-BY
SG011-SF-EY
SG024-SF-EY
SG023-SF-FY
SG023-SF-BY
SG041-SF-EY
SG041-SF-GD
SG060-SF-EY
SG021-SF-EY
SG080-SF-02
SG064-SF-EY
SG065-SF-EY
SG091-SF-FY
SG114-SF-EY
SG110-SF-EY
SG124-SF-EY
SG123-SF-EY
SG122-SF-EY

N
W E
S
0 100 200
Feet

Legend

- Southside Gardens
- Area of Observed Contamination
- Area of Observed Contamination and Level II Parcel
- SG### Project-specific Property Number

BY Backyard
EY Entire Yard
FY Front Yard
GD Garden
SF Surface Soil

Map Source:
ESRI Aerial Imagery, 2011-2012. The source of this map image is ESRI, used by the EPA with ESRI's permission.
Reference 32, Appendices A and B

United States Environmental Protection Agency Region 4

FIGURE 6

Southside Gardens
Area of Observed Contamination

Site Name: Southside Chattanooga Lead Site
TDD No.: TT-05-031
City: Chattanooga **County:** Hamilton **State:** Tennessee

TETRA TECH

Date: 8/7/2017
Analyst: Clayton.Hayes

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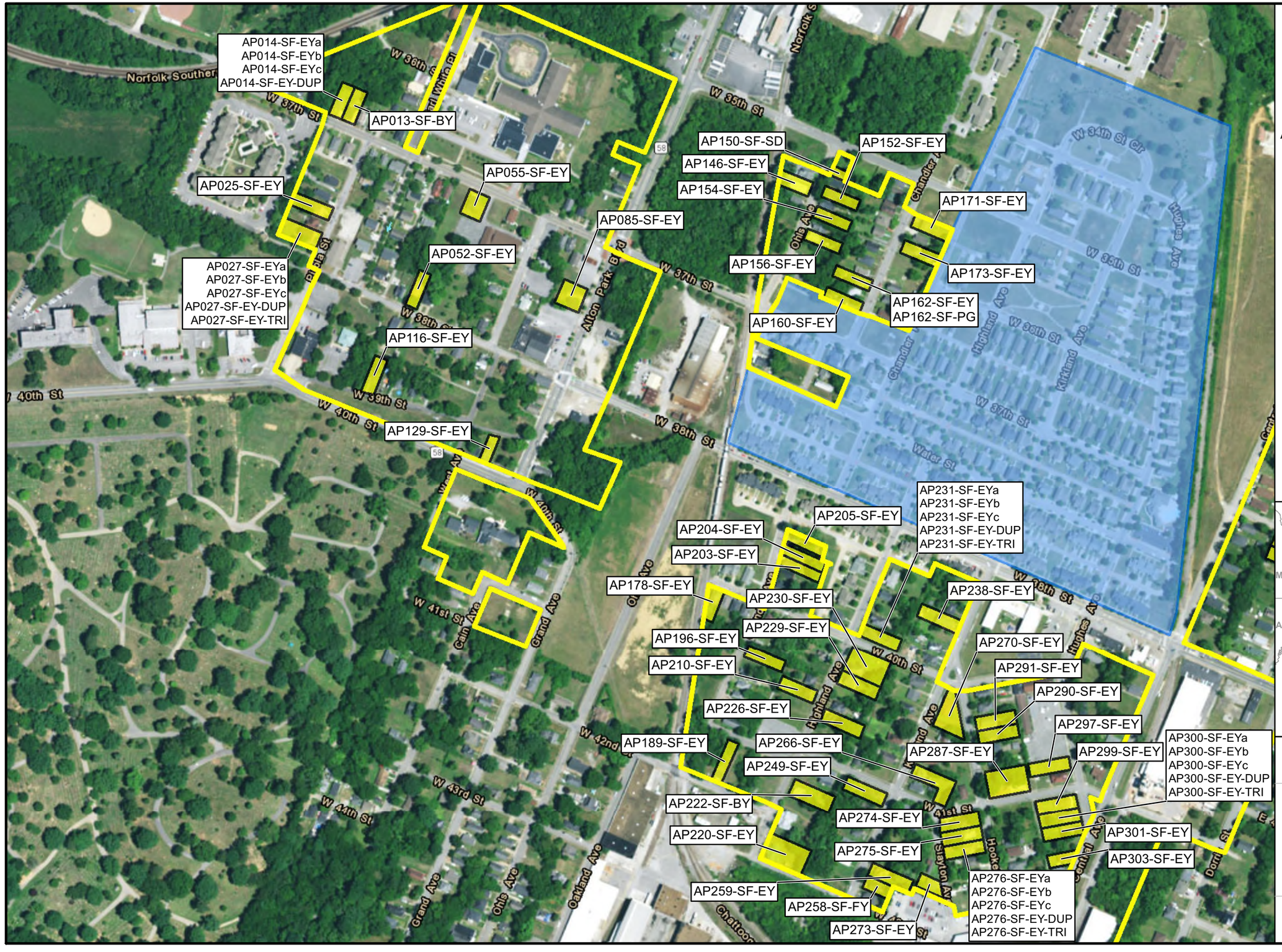

United States Environmental Protection Agency Region 4

FIGURE 7A

Alton Park - West of Central
Area of Observed Contamination

Site Name: Southside Chattanooga Lead Site
TDD No.: TT-05-031
City: Chattanooga **County:** Hamilton **State:** Tennessee

TETRA TECH

Date: 8/7/2017
Analyst: Clayton.Hayes

File: X:\G\9027\05\031\Projects\mxd\Figure7A.mxd

AP350-SF-EY
AP353-SF-EY
AP344-SF-EY
AP343-SF-EY
AP376-SF-EY
AP362-SF-EY
AP375-SF-EY
AP392-SF-EY
See Figure 7A
AP408-SF-EY
AP412-SF-EY
AP462-SF-EY
AP512-SF-EY
AP495-SF-EY
AP491-SF-EY
W 36th St
Highland Ave
Kirkland Ave
W 37th St
Water St
Central Ave
Dorris St
E 37th St
Fagan St
W 38th St
Hughes Ave
E 38th St
Kirkland Ave
W 41st St
Stanton Ave
Hooker Rd
E 40th St
E 41st St
E 42nd St
Workman Rd

Legend

- Alton Park
- Area of Observed Contamination and Level II Parcel
- McCallie Homes Brownfields Removal
- AP### Project-specific Property Number
- EY Entire Yard
- SF Surface Soil

N
W E
S
0 150 300
Feet

Map Source:
ESRI Aerial Imagery, 2011-2012. The source of this map image is ESRI, used by the EPA with ESRI's permission.
Reference 32, Appendices A and B; 34, p. 9; 39, p. 13; 64, p. 18.

Ohio
Indiana
Illinois
West Virginia
Kentucky
Missouri
Virginia
TENNESSEE
Arkansas
Hamilton County
North Carolina
South Carolina
Mississippi
Alabama
Georgia

United States
Environmental Protection Agency
Region 4

FIGURE 7B

Alton Park - East of Central
Area of Observed Contamination

Site Name: Southside Chattanooga Lead Site
TDD No.: TT-05-031
City: Chattanooga **County:** Hamilton **State:** Tennessee

TETRA TECH

Date: 8/7/2017
Analyst: Clayton.Hayes

File: X:\G\9027\05\031\Projects\mxd\Figure7B.mxd

Legend

- College Hill Courts
- Area of Observed Contamination and Level II Sub-Parcel
- CH### Project-specific Property Number
- SF-## Grid Number
- a,b,c Sub-sampling Triplicate
- DUP Duplicate
- SF Surface Soil
- TRI Triplicate

Map Source:
ESRI Aerial Imagery, 2011-2012. The source of this map image is ESRI, used by the EPA with ESRI's permission.
Reference 32, Appendices A and B

United States
Environmental Protection Agency
Region 4

FIGURE 8

College Hill Courts
Area of Observed Contamination

Site Name: Southside Chattanooga Lead Site

TDD No.: TT-05-031

City:	County:	State:
Chattanooga	Hamilton	Tennessee

TETRA TECH

Date: 8/7/2017

Analyst: Clayton.Hayes

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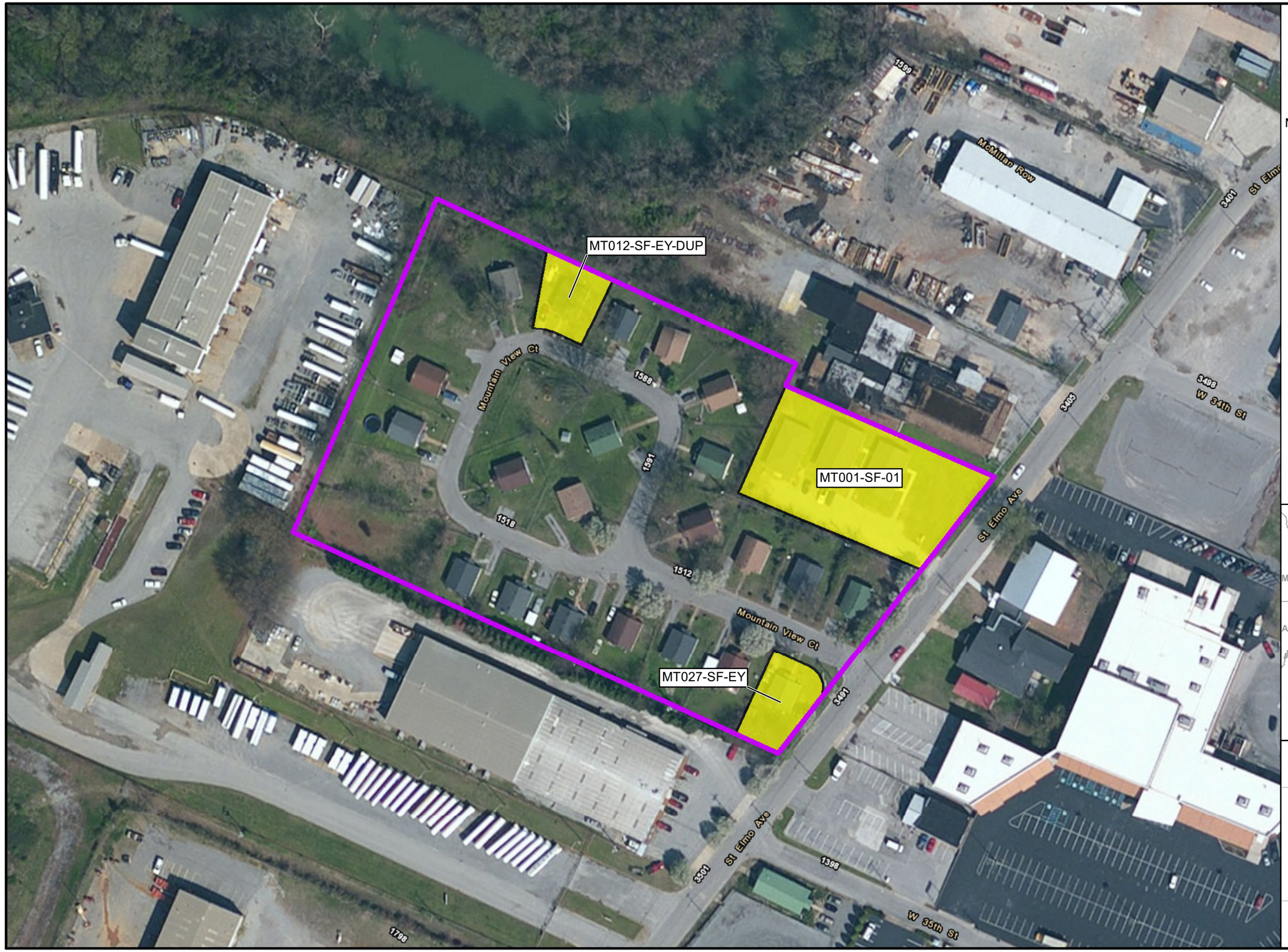


Legend

- Mountain View Court
- Area of Observed Contamination and Level II Parcel
- MT### Project-specific Property Number
- DUP Duplicate
- EY Entire Yard
- SF Surface Soil

N
W E
S

0 50 100
Feet

Map Source:
ESRI Aerial Imagery, 2011-2012. The source of this map image is ESRI, used by the EPA with ESRI's permission. Reference 32, Appendices A and B

United States Environmental Protection Agency Region 4

FIGURE 9

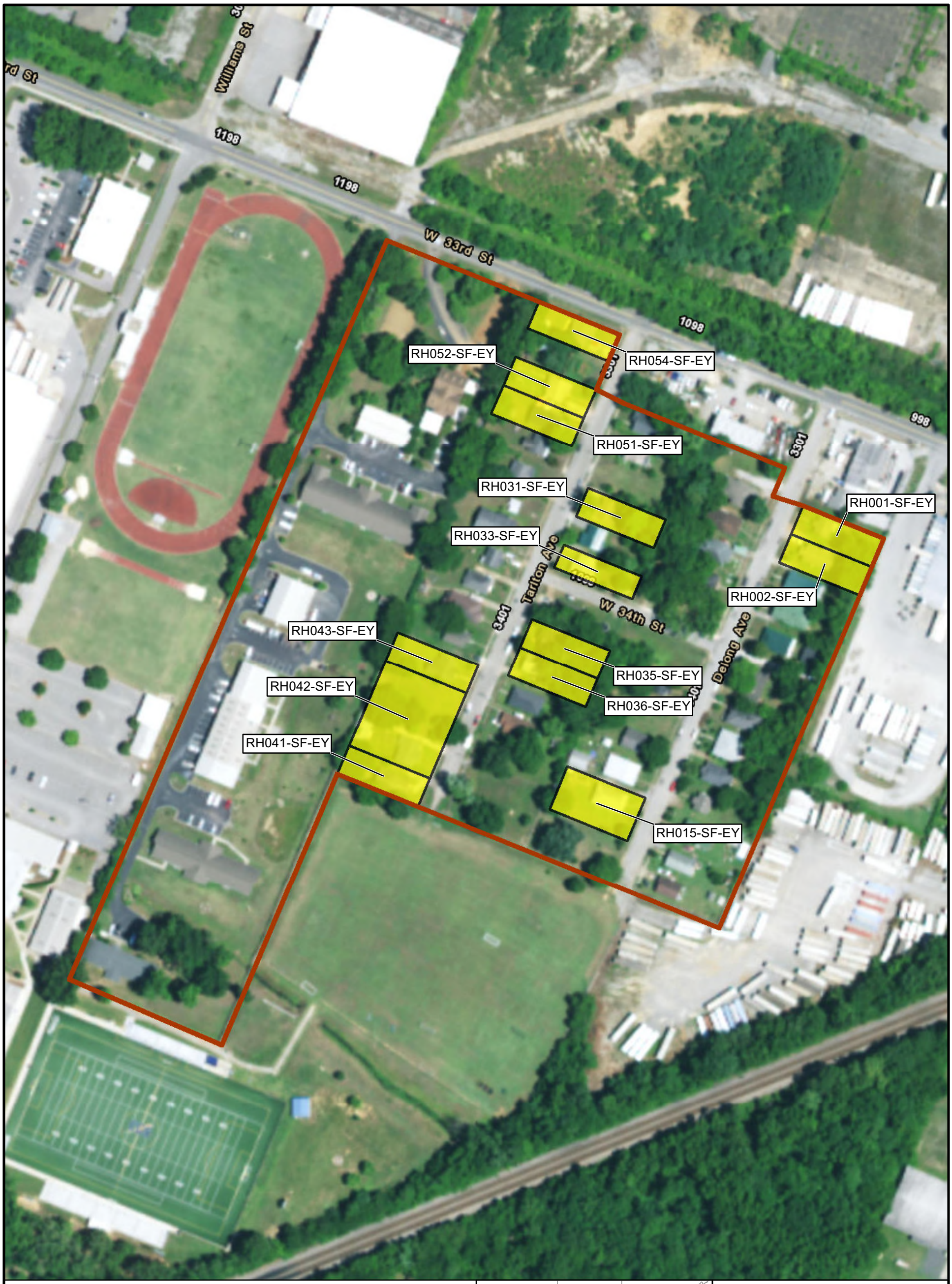
Mountain View Court
Area of Observed Contamination

Site Name: Southside Chattanooga Lead Site
TDD No.: TT-05-031
City: Chattanooga **County:** Hamilton **State:** Tennessee

TETRA TECH

Date: 8/7/2017
Analyst: Clayton.Hayes

File: X:\G\9027\05\031\Projects\mxd\Figure9.mxd



Legend

- Richmond
- Area of Observed Contamination and Level II Parcel
- RH### Project-specific Property Number
- EY Entire Yard
- SF Surface Soil

N W E S

0 75 150

Feet

Map Source:
ESRI Aerial Imagery, 2011-2012. The source of this map image is ESRI, used by the EPA with ESRI's permission.
Reference 32, Appendices A and B

United States
Environmental Protection Agency
Region 4

FIGURE 10

Richmond
Area of Observed Contamination

Site Name: Southside Chattanooga Lead Site

TDD No.: TT-05-031

City:	County:	State:
Chattanooga	Hamilton	Tennessee

TETRA TECH

Date: 8/7/2017

Analyst: Clayton.Hayes

File: X:\G\9027\05\031\Projects\mxd\Figure10.mxd

File: X:\G\9027\05\031\Projects\mxd\Figure11.mxd

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1a. EPA. Addition of a Subsurface Intrusion Component to the Hazard Ranking System, 40 Code of Federal Regulations Part 300, 82 Federal Register 2760. January 9, 2017. 48 Pages. Available on-line at https://www.regulations.gov/document?D=EPA-HQ-SFUND-2010-1086-0104.

2. EPA. Superfund Chemical Data Matrix (SCDM) Query. Data Extracted on August 7, 2017. Available on-line at: https://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm-query. 2 Pages.

3. U.S. Geological Survey (USGS). Chattanooga Quadrangle, Tennessee. 7.5 Minute Series (Topographic). Scale, 1:24,000. 1969. Photorevised 1976. Note: Modified by Tetra Tech on April 11, 2017, to add the Location of the Southside Chattanooga Lead Site. 1 Map.

4. Tetra Tech, Inc. (Tetra Tech). Project Note to File with Attachments. Subject: Coordinates for the Former Chattanooga Foundries site located in Chattanooga, Hamilton County, Tennessee. Attachments: Google Earth Map and Conversion of Coordinates. August 14, 2017. 4 Pages.

5. EPA Region 4, Science and Ecosystem Support Division (SESD). Memorandum with Attachment to Cathy Amoroso. Subject: Final Analytical Report. Attachment: EPA SESD Project 17-0055, Southside Chattanooga Lead Site Analytical Report. March 8, 2017. 104 Pages.

6. Superfund Enterprise Management System (SEMS). Former Chattanooga Foundries. Chattanooga, Hamilton County, Tennessee. EPA ID No. TNN000410686. Accessed on August 14, 2017. Available on-line at: https://sems.epa.gov/adfsems/faces/sitedescription?_adf.ctrl-state=1dcapy4h4g_9. 1 Page.

7. Tetra Tech. Soil Sample Field Forms. Southside Chattanooga Lead Site. Site Inspection, Set 1. October 2016. 115 Pages.

8. Tetra Tech. Final Sampling and Analysis Plan, Southside Chattanooga SI. Chattanooga, Hamilton County, Tennessee. Prepared for EPA Region 4, EPA Contract No. EP-S4-14-03, TDD No. TT-05-24. October 21, 2016. 63 Pages.

9. Tetra Tech. Project Note with Attachments to File for Southside Chattanooga Lead Site. Subject: Southside Chattanooga Lead Site – Site Inspection – Set 1 Chain of Custody Records. February 22, 2017. Attachments: Chain of Custody Records. 10 Pages.

10. Tetra Tech. Soil Sample Field Forms. Southside Chattanooga Lead Site. Site Inspection Set 2. January 2017. 270 Pages.

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12. Tetra Tech. Project Note with Attachments to File for Southside Chattanooga Lead Site. Subject: Southside Chattanooga Lead Site – Site Inspection – Set 2 Chain of Custody Records. February 22, 2017. Attachments: Chain of Custody Records. 26 Pages.

13. Tetra Tech. Letter with Attachment to Cathy Amoroso, Remedial Project Manager, EPA Region 4. Subject: Abbreviated Preliminary Assessment (PA) Checklist, Former Chattanooga Foundries, Chattanooga, Hamilton County, Tennessee, EPA Contract No. EP-S4-14-03, TDD No. TT-05-024. March 21, 2017. Attachment: Abbreviated PA Checklist. 5 Pages.

14. EPA Region 4, SESD. Memorandum with Attachment to Cathy Amoroso. Subject: Final Analytical Report. Attachment: EPA SESD Project 17-0147, Southside Chattanooga Lead Site Analytical Report. March 24, 2017. 105 Pages.

15. EPA Region 4, SESD. Memorandum with Attachment to Cathy Amoroso. Subject: Final Analytical Report. Attachment: EPA SESD Project 17-0148, Southside Chattanooga Lead Site Analytical Report. March 7, 2017. 118 Pages.

16. EPA. Contract Laboratory Program (CLP) Statement of Work (SOW) for Inorganic Superfund Methods, Multi-Media, Multi-Concentration, ISM02.3. September 2015. 430 Pages.

17. Tetra Tech. Project Note to File. Subject: Data Review, Validation, and Verification Conducted at the SESD, Analytical Support Branch. January 6, 2009. 1 Page.

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SITE SUMMARY

The Southside Chattanooga Lead Site (SCLS) is composed of lead-contaminated soil on residential (single and multi-family) and non-residential (churches, parks, play areas, and vacant lots) properties where foundry waste material was used as fill or top soil (Refs. 7, pp. 16 through 112; 10, pp. 3 through 182, 194 through 269; 24; 31; 32, Appendices A and B; 33; 35; 61). Reference documents refer to the SCLS or portions of the SCLS site as the Read Avenue Lead Removal site, Read Avenue Lead site, Site, Former Chattanooga Foundries site, Jefferson Heights, and the SCLS; however, the name Southside Chattanooga Lead Site or the SCLS will be used throughout this HRS documentation record (Ref. 71). The lead-contaminated soil is present at Level II concentrations on residential and non-residential properties in the Alton Park, College Hill Courts, Cowart Place, Jefferson Heights, Mountain View Court, Richmond, and the Southside Gardens areas in the southwestern portion of Chattanooga, Hamilton County, Tennessee. The Level II residential and non-residential properties where lead was detected in surface soil samples above background levels comprise the area of observed contamination (AOC A) (see Figures 2 and 4 through 10 of this HRS documentation record) (Ref. 61). The primary mode of deposition of the contamination within AOC A is believed to be the use of foundry waste material as fill or top soil (Refs. 24, p. 1; 33). For HRS scoring purposes, the SCLS focuses on lead-contaminated soil significantly above background levels on four church-owned properties, one park, two vacant lots zoned as residential, and 124 residential properties (122 occupied and two unoccupied at the time of sampling) where removals have not occurred within AOC A (see Section 5.0.1, General Considerations, and Figures 1 and 4 through 10 of this HRS documentation record) (Ref. 61). As a conservative measure, properties within AOC A where EPA removal actions have occurred or are ongoing (such as the Read Avenue and Jefferson Heights areas) are not being scored, nor are properties not currently occupied or residential and non-residential properties that have not yet been sampled (Refs. 35; 61). Contamination on residential and non-residential properties at the SCLS also is not being inferred in the absence of sampling results because the suspected mode of deposition of the contamination is the use of foundry waste material as fill or top soil and, therefore, is likely not uniformly distributed throughout the AOC. Exclusion of these properties from scoring does not indicate an absence of contamination (Refs. 24, p. 1; 35). The EPA identification number for the SCLS in the Superfund Enterprise Management System (SEMS) is TNN000410686 (Ref. 6). The coordinates for the SCLS, as measured from the intersection of East 16th Street and Jefferson Street in Chattanooga, Tennessee, are latitude 35° 01' 57.1872" degrees north and 85° 18' 2.0124" degrees west (Ref. 4, pp. 1, 2). Reference documents use the terms foundry sand, sand, black sand fill, spent casting sand, waste foundry sand, waste foundry material, and foundry waste material, among others; however, the term foundry waste material will be used in this HRS documentation record (Refs. 24; 26; 33; 45, p. 23; 46, p. 4; 51, pp. 48, 49; 53, pp. 7, 16 to 18). Foundry waste material is generally composed of waste sand, dust from collection systems, slag, spent casting refractory material, off-spec products, and other miscellaneous wastes (Ref. 70, p. 41). In order to prioritize human health, the EPA conducted a site inspection (SI) that focused on occupied residential properties (Refs. 31; 32, pp. 5, 17). Commercial, industrial, and vacant areas are located between the areas included in the SI sampling; but haven't been investigated. (Refs. 32, pp. 2, 23; 61).

SITE HISTORY

Since the late 19th century, numerous foundries, typically brass, iron, and steel, have operated within the City of Chattanooga (Refs. 24; 43, p. 5; 65). Most of these foundries were located between Broad Street and the Tennessee River in the southwestern portion of Chattanooga (Refs. 24; 36, p. 6) (see Figure 2 of this HRS documentation record). Some of these foundries include Chattanooga Car and Foundry, Chattanooga Pattern and Foundry, Eureka Foundry, Ross-Meehan Foundry (Ross-Meehan), Southern Foundry and Supply, Inc., Wheland Foundry (Wheland), and U.S. Pipe Foundry Company (U.S. Pipe) (Refs. 25, pp. 6, 7; 43, p. 5; 44, pp. 25, 26; 45, p. 3;). Over time, some of the foundries acquired other foundries and consolidated operations (Refs. 43, p. 5; 46, p. 4). The three most prominent foundries that operated in the Chattanooga area included Wheland (circa 1873), U.S. Pipe (circa 1899), and Ross-Meehan (circa 1889) (Refs. 24; 36, p. 6; 43, p. 5; 44, p. 25; 45, p. 3; 51, p. 4). These prominent foundries were located along the western boundary of AOC A (Refs. 24; 36, p. 6) (see Figure 2 of this HRS

documentation record). Properties within AOC A show indications of foundry waste material having been used as fill material or top soil (Refs. 24, p. 1; 33; 34, p. 1; 65).

Foundries, including the three most prominent ones – Wheland, U.S. Pipe, and Ross-Meehan – are not evaluated as sources because these former foundries are enrolled in the Tennessee Department of Environment and Conservation (TDEC) Voluntary Oversight and Assistance Program and has conducted or is continuing to conduct remedial activities (Refs. 45, pp. 1, 2; 72, pp. 1, 3; 73, p. 1). Based on a review of TDEC files, historical information is available for the three most prominent former foundries and a discussion of each is provided below.

Wheland operated two plants and a landfill in the Chattanooga area from 1873 to at least 1999 (Ref. 44, pp. 25, 26). The plants were located at 1506 Middle Street (Middle Street Plant) and 2800 South Broad Street (Broad Street Plant), and the landfill is located at 3331 St. Elmo Avenue. The plants and landfill were located along the western boundary of AOC A (Ref. 44, pp. 5, 12) (see Figure 2 of this HRS documentation record). The Middle Street plant was a ductile iron plant and the Broad Street Plant was a ductile iron and gray iron plant (Ref. 44, pp. 5. 6, 18, 19). In the 1980s, Wheland acquired land near the Broad Street Plant; that land was used by its previous owner to stockpile foundry material that was sold for construction fill (Ref. 44, p. 27). Wheland also owned a landfill located on Long Street that was used for the disposal of solid wastes that included spent casting and core sands, slag, and baghouse dust, among other items and a landfill on St. Elmo Avenue, the Wheland St. Elmo Landfill (Refs. 44, p. 20; 65; 66, p. 4).

U.S. Pipe operated in the Chattanooga area from about 1899 to about 2006 (Refs. 51, p. 4; 56; 62). U.S. Pipe operated two plants on separate properties: a soil pipe plant at 1000 W. 19th Street, and a valve and fittings plant at 2701 Chestnut Street (Refs. 48, p. 23; 49, p. 2; 50, p. 2). The two former plants are located along the western boundary of AOC A (see Figure 2 of this HRS documentation record). In addition to the soil pipe plant and valve and fittings plant, U.S. Pipe operated a landfill on a contiguous property between the two plants that was used for the disposal of foundry waste material (Refs. 48, pp. 23, 197; 60, p. 4) (see Figure 2 of this HRS documentation record). The landfill operated since 1956 and primarily received foundry waste material (Ref. 48, p., 262). The soil pipe plant was a gray foundry (cast iron) that maintained a cupola coke-fired furnace to produce cast iron pipes (Ref. 48, pp. 23, 254). The valve and fittings plant included two separate foundries: (1) a valve plant that operated a brass foundry and produced brass and bronze valves, maintained a lead melting kettle, and assembled fire hydrants; and (2) a fittings plant that operated as a gray foundry and produced ductile iron pipe fittings, fire hydrants, and special order castings (Ref. 48, pp. 23, 24, 198, 254). Molten lead was used to seal brass and bronze valves into housings at the valve plant (Ref. 48, p. 254).

Ross-Meehan began operations in 1889 (Refs. 43, p. 5; 45, p. 3). Ross-Meehan ceased operations in 1986 as a result of bankruptcy and in 1988, ownership of the property was conveyed to the Kessler Industrial Corporation (Refs. 46, p. 4; 47, p. 3). Ross-Meehan operated on two properties located at 1610 and 1801 Carter Street, along the western boundary of AOC A (Refs. 45, p. 3; 46, pp. 3, 4) (see Figure 2 of this HRS documentation record). Ross-Meehan originally operated an iron foundry at 1610 Carter Street, which was later occupied by Eureka Foundry (Refs. 43, pp. ii, 5; 45, p. 3). Subsequently, Ross-Meehan operated a steel foundry at the 1801 Carter Street location (Ref. 43, p. 5). A 4-acre foundry waste material dump was located in an open yard in the western portion of the Ross-Meehan property (Ref. 43, p. 3).

Ferrous (iron and steel) and non-ferrous (brass) foundries, like the ones mentioned above, specialize in melting and casting metal into desired shapes. Foundry products include parts for automobiles, train locomotives, and airplanes, fire hydrants, as well as plumbing fixtures and equipment components (Refs. 26, p. 1; 27, p. 13). Foundries produce sand fines which are too small to reuse and thus were often landfilled (Ref. 26, p. 4). Until the advent of the Resource Conservation and Recovery Act (RCRA), in the early 1970s, facilities discarded their used foundry waste material on their own properties, sent them to local landfills, or gave them away to be used as fill or as a top soil layer on other properties. There are many properties in older industrial areas built on top of foundry waste material, which is generally an

excellent fill material providing strong structural support (Refs. 24, p. 1; 54, p. 1). This process came to a halt with the advent of RCRA (Ref. 54, p. 1). Non-ferrous and steel foundries may produce hazardous waste because of lead, zinc, cadmium, and other metals present in the waste (Ref. 26, p. 4). See the Attribution section of this HRS documentation record for more details regarding ferrous foundries and their disposal methods.

PREVIOUS INVESTIGATIONS – FORMER FOUNDRIES

Environmental investigations have been conducted at former foundry properties located west of the SCLS. The locations of the former foundries are depicted on Figure 2 of this HRS documentation record. Table 1 of this HRS documentation record provides a brief summary of the previous investigations conducted at the former foundries and the hazardous substances detected in the samples collected.

TABLE 1: Summary of Previous Investigations					
Company/ Agency	**Investigation**	**Date**	**Samples Collected**	**Hazardous Substances Detected[1]**	**References**
Wheland Foundry					
Law Engineering and Environmental Services	Phase I ESA	January 2002	None – File review, site reconnaissance, personnel interviews	NA	44, pp. 2, 3
Law Engineering and Environmental Services	Phase II ESA	June 2002	Soil Groundwater	Arsenic, Cadmium, Chromium, Lead, Selenium, Silver, and Mercury among others	53, pp. 8, 9
Ross-Meehan Foundry					
TDEC, DSF	Preliminary Assessment	March 1995	None, file review site visit	NA	43, p. 1
Law Engineering and Environmental Services	Remedial Investigation	July and August 1996	Soil Sediment Groundwater	Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc, among others	45, pp. 5, 22, 23, 24, 50 to 58
U.S. Pipe and Foundry					
AT Kearney	RCRA Facility Assessment	January 1989 to March 1990	None, file review, site reconnaissance, personnel interviews	NA	48, pp. 2, 14, 23, 46 to 48
Aquaterra	Phase II ESA	April and May 2006	Soil and groundwater	Arsenic, Cadmium, Chromium, Lead, Manganese, Mercury, among others	51, pp. 30, 31, 32, 39, 40, 97 to 118

Notes:

[1] Hazardous substances listed focuses on the presence of metals
DSF Division of Superfund
ESA Environmental site assessment
NA Not applicable
RCRA Resource Conservation and Recovery Act
TDEC Tennessee Department of Environment and Conservation

PREVIOUS EPA AND TDEC INVESTIGATIONS

In 2011, a resident went to the emergency room presenting severe fatigue and abdominal pain. Blood tests revealed lead levels approaching 20 micrograms per deciliter (µg/dL) (Ref. 40, p. 1). The Centers for Disease Control and Prevention (CDC) and the Council of State and Territorial Epidemiologists recognize that adverse health effects can occur at blood lead levels below 10 µg/dL. Also, national consensus has emerged that the definition of "elevated" (blood lead) should be reduced from 10 µg/dL to 5 µg/dL (Ref. 22, p. 1). TDEC was alerted and requested assistance from EPA's Emergency Response and Removal Branch (ERRB) to conduct a soil assessment at the residence on Read Avenue (Refs. 37, p. 4; 40, p. 1).

In May 2011, the EPA ERRB, with assistance from TDEC and the EPA Science and Ecosystem Support Division (SESD), conducted an assessment at three residential properties along Read Avenue and an adjoining public park located at 1700 Mitchell Avenue (Refs. 37, p. 4; 40, p. 1; 71). The Read Avenue Lead Removal Site is located between the Cowart Place and the Jefferson Heights areas of AOC A (Refs. 38, pp. 11, 12; 39, p. 16; 61) (see Figures 1 and 2 of this HRS documentation record).

The assessment of properties in the Read Avenue area was conducted to characterize the nature and extent of arsenic and lead concentrations (Ref. 37, p. 4). During the week of May 2, 2011, EPA collected 11 composite surface soil (0 to 6 inches below ground surface [bgs]) samples from 10 locations at the park and three residential properties for analysis of arsenic and lead. Analytical results were compared with the EPA Removal Action Levels (RAL) of 400 milligrams per kilogram (mg/kg) for lead and 39 mg/kg for arsenic in residential soil (Ref. 37, pp. 4, 5). Lead was detected at concentrations ranging from 31 mg/kg to 2,500 mg/kg. Arsenic concentrations ranged from 1.2 mg/kg to 4.7 mg/kg. Lead exceeded its EPA RAL of 400 mg/kg for residential soil in two samples collected from the same residential property, RA01 at 2,500 mg/kg, and RA03 at 580 mg/kg (Ref. 37, pp. 6, 7, 12, 15). RA01 was collected from the front yard and RA03 was collected from the back yard of the property (Ref. 37, p. 12). Arsenic was not detected above its EPA RAL of 39 mg/kg (Ref. 37, pp. 7, 15). According to SESD, the samples collected during the investigation were composed of a coarse black material, generally found beneath several inches of reddish clayey overburden. The material closely resembled foundry waste material, commonly associated with high lead concentrations at other sites (Ref. 37, p. 6). The highest lead concentrations were associated with locations where a black material resembling foundry waste material was present in the samples (Ref. 37, p. 4).

Based on the results of the May 2011 investigation, EPA conducted a removal assessment of 14 additional residential properties in the Read Avenue area in October. Lead was detected above its EPA RAL of 400 mg/kg for residential soil in eight samples (five from residences on Mitchell Avenue and three from residences on Read Avenue). Arsenic concentrations ranged from non-detect to 16J (estimated) mg/kg (Ref. 38, pp. 7, 13, 14, 16).

Based on the results of the May and October 2011 investigations, the historical presence of several foundries in the vicinity of the SCLS, and the proximity of other residential areas, EPA conducted a site reconnaissance of 17 areas surrounding the Read Avenue area from June to August 2012. The reconnaissance included X-ray fluorescence (XRF) screening for lead and arsenic (Ref. 39, pp. 1, 3). XRF screening locations were chosen based on visual observations in areas where soil was exposed along intersecting streets or embankments (Ref. 39, p. 3). EPA screened 235 soil samples collected from the following areas: Jefferson Heights (58 locations), West of Market Street (now Cowart Place) (25 locations), Westside Community (four locations), the former McCallie Homes (14 locations), Oak Hill (eight locations), Richmond (four locations), Alton Park (four locations), East Lake (20 locations), Ferger Place (17 locations), Oak Grove (eight locations), Highland Park (17 locations), Orchard Knob (four locations), Bushtown (20 locations), Ridgedale (three locations), Missionary Ridge (four locations), West of Rossville Boulevard (three locations), and St. Elmo (five locations) (Ref. 39, pp. 4 through 10, 16 to 25). Of the 235 soil screening locations, 31 contained lead at concentrations above its EPA RAL, and eight contained arsenic above its EPA RAL (Ref. 39, pp. 17 through 28).

From September 24, 2012 through December 5, 2013, EPA conducted a time-critical removal action at the Southside Chattanooga Lead Removal site (previously referred to as the Read Avenue Lead Removal site, and since renamed "Southside Chattanooga Lead Site") to mitigate potential threats to human health and the environment (Refs. 41, p. 1; 71). Contaminated soil was removed to a depth of 1 foot or less if the native clay was observed and screening results were below respective RALs (Ref. 41, p. 4). During the removal action, approximately 8,222 tons of contaminated soil was removed from a total of 84 properties (81 residential properties and three church-owned properties) (Ref. 41, p. 11).

In October 2016 (Set 1) and January 2017 (Set 2), EPA conducted a site inspection (SI) at the SCLS (Ref. 32, pp. 4, 5, 10) as defined for HRS scoring purposes in this HRS documentation record. Residential and non-residential properties comprise the study area, and the SI was broken into two study sets. Set 1 of the SI focused on three residential areas in downtown Chattanooga, Tennessee: Southside Gardens, Jefferson Heights, and Cowart Place. Although sampling in these areas continued during Set 2 of the SI, Set 2 primarily focused on four additional residential areas: College Hill Courts, Richmond, Mountain View Court, and parts of Alton Park (Ref. 32, p. 5) (see Figure 2 of this HRS documentation record). During Set 1, EPA collected surface soil samples from 58 properties (Ref. 32, p. 10). During Set 2, EPA collected surface soil samples from 175 properties; the College Hill Courts property was subdivided into 23 subunits (Ref. 32, p. 13). Although other metals were found in foundry soils, sediments and/or groundwater (see Table 1 of this HRS documentation record), the SI focused on evaluation of lead in the soil because lead is the primary contaminant of concern related to foundry waste material (Ref. 32, pp. 20 to 22). Of the 233 properties sampled during the SI, 135 residential properties, three church properties, and one park property contained lead equal to or greater than three times background levels (Ref. 32, p. 25. In addition, lead levels at 41 of the 139 properties were above the EPA Removal Management Level (RML) (previously RAL) of 400 mg/kg for lead in residential soil (Refs. 32, pp. 21 to 23, 34 to 38, 41, 45 to 56; 55, p. 8).

During the SI, two foundry waste material samples were collected from former U.S. Pipe, one foundry waste material sample was collected from the former Wheland facility, and one foundry waste material sample was collected from the Wheland St. Elmo landfill (Refs. 7, pp. 113, 114, 115; 10, p. 270; 33) (see Figure 11 of this HRS documentation record). Analytical results indicated the presence of lead in these samples at concentrations that ranged from 960 mg/kg to 3,900 mg/kg (Refs. 5, pp. 85 to 87; 15, p. 118; 32, p. 57).

The EPA is continuing to evaluate properties in the study area and may conduct additional sampling in the future. In May 2017, to protect human health, EPA began a time-critical removal action in the Jefferson Heights area to address the properties with the highest lead concentrations (above 1,200 mg/kg). Properties were prioritized based on residences with children and additional removals may be conducted at a later date (Ref. 35). Properties where a removal has occurred (84 properties in the Read Avenue area) or is planned to occur (four properties in the Jefferson Heights area) are not evaluated in this HRS documentation record.

5.0 SOIL EXPOSURE AND SUBSURFACE INTRUSION PATHWAY

SOIL EXPOSURE COMPONENT

5.0.1 General Considerations

According to the HRS, the soil exposure component of the soil exposure and subsurface intrusion pathway is based on areas of observed contamination (Ref. 1, Section 5.0.1). All soil samples evaluated for the area of observed contamination were collected at a depth of 0 to 4 inches bgs (Refs. 7, pp. 45 through 112; 10, pp. 3 through 178, 194 through 270) (see also Tables 4 and 6 of this HRS documentation record). The SCLS area of observed soil contamination is defined for HRS scoring purposes based on analytical results for soil samples collected during the EPA SI sampling events conducted in October 2016 and January 2017 (Refs. 5, pp. 14 through 84; 14, pp. 8 through 105; 15, pp. 19 through 117). Analytical results for soil samples indicated lead is present at concentrations equal to or greater than three times the designated background level and at concentrations greater than the corresponding sample quantitation limits (SQL) (Refs. 5, pp. 14 through 84; 14, pp. 8 through 105; 15, pp. 19 through 117) (see also Tables 5 and 7 of this HRS documentation record).

Letter by which this area is to be identified: A

Name and description of the area: AOC A is composed of surface soils impacted by elevated (equal to or greater than three times background) levels of lead in residential (single and multi-family) and non-residential (churches, parks, play areas, and vacant lots) properties in an area in the southern portion of Chattanooga, Tennessee, where foundry waste material was used as top soil and fill material (Refs. 7, pp. 16 through 112; 10, pp. 3 through 182, 194 through 269;24; 33) (see Figure 2 of this HRS documentation record).

Type of the area: Contaminated soil

Location of the area, with reference to a map of the site:

AOC A is contaminated surface soil that contains lead above background levels throughout Alton Park, College Hill Courts, Cowart Place, Jefferson Heights, Mountain View Court, Richmond, and Southside Gardens in the southwestern portion of Chattanooga, Tennessee. Most of the properties included in AOC A are residential (Refs. 7, pp. 16 through 112; 10, pp. 3 through 178, 194 through 270) (see also Figure 1 of this HRS documentation record). In order to prioritize human health, the EPA SI focused on occupied residential properties (Refs. 31; 32, pp. 5, 17, 19). Commercial, industrial, and vacant areas are located between the areas included in the SI sampling; but haven't been investigated (Refs. 32, pp. 5, 17, 26; 61).

Soil samples that meet observed contamination criteria were used to delineate AOC A (Ref. 1, Table 2-3; see Tables 5 and 7 of this HRS documentation record). In accordance with Section 5.0.1, General Considerations of the HRS, areas lying between sampling locations, except those areas that are covered by an impenetrable material, are included in AOC A (Ref. 1, Section 5.0.1) (see also Figures 4 through 10 of this HRS documentation record). Properties within AOC A show indications of foundry waste material having been used as fill material or top soil (Refs. 24; 33). Lead has been detected at varying concentrations in soil samples collected from AOC A (Refs. 5, pp. 14 through 84; 14, pp. 8 through 105; 15, pp. 19 through 117). The use of foundry waste material on residential and non-residential properties is not uniform on individual or among adjacent properties (Refs. 24, p. 1; 33). On properties where fill mostly consists of foundry waste material, the fill is a dark brown, gray or black, course material that sometimes has slag and baghouse dust mixed in. However, when foundry waste material is mixed with soil, it may be difficult to differentiate the soil mixed with foundry waste material and soil that does not contain foundry waste material (Refs. 24; 67, pp. 1 through 16). The soil samples collected from AOC A were collected from 0 to 4 inches bgs and primarily consisted of dark brown silt, dark brown silty loam, and dark brown sand (Ref. 7, pp. 16 through 112; 10, pp. 3 through 178, 194 through 270; 67, pp. 4 through 16).

Lead has been detected in AOC A above background levels on about 131 properties, including 126 residential (122 occupied, two unoccupied, and two vacant lots), one park, and four church-owned properties, one of which maintains a play area for an after-school program (Refs. 32, p. 21; 28, pp. 1 through 5). The extent of AOC A is delineated by contaminated soil samples contained in Tables 5 and 7 of this HRS documentation record.

Some properties that are geographically located within AOC A are not scored. Specifically, properties within AOC A where EPA removal actions have occurred or are ongoing, properties not currently occupied, and residential and non-residential properties that have not yet been sampled, are not included in the HRS score (Refs. 35; 61). In the absence of sampling results, contamination on residential and non-residential properties at the SCLS is not being inferred. Only those properties with sampling results indicating lead levels equal to or greater than three times background levels are included in the HRS score. Exclusion of properties that have not been sampled from scoring does not indicate an absence of contamination at these properties (Ref.35; 61). Further delineation of lead contamination may be done in the future.

Background Levels

Samples collected from three local parks and a community center property during Set 1 of the SI were evaluated to establish background levels for lead (Refs. 7, pp. 3 to 6, 15 to 112; 10, pp. 3 to 182, 194 to 270) (see Figures 3 through 10 of this HRS documentation record). Lead is the only contaminant discussed in this HRS documentation record because lead is the primary contaminant of concern related to foundry waste material (Ref. 32, p. 21). Foundry waste material was not observed in the background samples. The background samples were collected from three parks and a community center property located about 1 to 2 miles north-northeast of AOC A (Refs. 7, pp. 3 to 6; 31; 61) (see Figure 3 of this HRS documentation record).

Background Samples

Soil samples collected from one community center and three parks are used to represent background levels for lead for comparison to contaminated soil samples. The background soil samples CHT040-SF-BG, CHT051-SF-BG, CHT055-SF-BG, CHT069-SF-BG, CHT040-SF-BG2, CHT051-SF-BG2, CHT055-SF-BG2, and CHT069-SF-BG2 were collected during the October 2016 Set 1 sampling event of the SI (Refs. p. 7, pp. 3, 4, 5, 6; 10, pp. 179, 180, 181, 182). The soil samples were 30-point composite surface soil samples that were collected from similar settings as the residential areas in AOC A (Refs. 31; 32, pp. 10, 11, 13, 33; 61) (see Figure 2 of this HRS documentation record). The SI background samples were collected at a depth of 0 to 4 inches bgs with stainless steel soil profilers, aluminum pans, and stainless steel spoons (Refs. 8, pp. 7, D-3; 11, pp. 7, D-3; 32, pp. 10, 11, 13). The background and AOC A (Set 1) samples were collected during the same sampling event and used the same sampling procedures (Refs. 8, pp. 7, 8; 11, pp. 7, 8; 32, pp. 10, 11, 13).

Background and contaminated soil samples were collected in accordance with the EPA-approved sampling and analysis plan and quality assurance project plans (SAP/QAPP) (Refs. 8, pp. I, C-1; 11, p. C-1). The composition of all soil samples evaluated to establish background levels and the contaminated soil samples collected from AOC A consisted primarily of light brown silt, dark brown silt, dark brown silt loam, and dark brown sand (Refs. 7, pp. 3 to 6, 15 to 112; 10, pp. 3 to 182, 194 to 270). The background and contaminated soil samples were collected from a community center, parks, churches, and residential areas during the same sampling event, in accordance with the same sampling procedures, and from the same soil type (light brown silt, dark brown silt, dark brown silt loam, and dark brown sand) (Refs. 7, pp. 16 through 112; 10, pp. 3 through 178, 194 through 270). The locations of the background soil samples are depicted in Reference 32, page 33 (see Figure 3 of this HRS documentation record). Chain-of-custody records for the background soil samples are provided in References 9 and 12 (Refs. 9, p. 1; 12, pp. 14, 19). Field sample collection sheets are provided in References 7 and 10 (Ref. 7, pp. 3, 4, 5, 6; 10, pp. 179, 180, 181, 182).

TABLE 2: Background Soil Sample Descriptions – Collected in October 2016					
Sample ID	**Sample Location**	**Physical Characteristics**	**Depth (inches bgs)**	**Date Sampled**	**References**
CHT040-SF-BG CHT040-SF-BG2	Northeastern portion of Chattanooga, Orchard Knob Avenue	Reddish brown silt loam	0 to 4	10/24/2016	7, p. 3; 9, p. 1; 10, p. 179; 12, p. 14
CHT051-SF-BG CHT051-SF-BG2	Northeastern portion of Chattanooga, south of Vine Street	Dark brown silt	0 to 4	10/24/2016	7, p. 4; 9, p. 1; 10, p. 180; 12, p. 19
CHT055-SF-BG CHT055-SF-BG2	Northeastern portion of Chattanooga, north of East 3rd Street	Dark brown silt	0 to 4	10/24/2016	7, p. 5; 9, p. 1; 10, p. 181; 12, p. 19
CHT069-SF-BG CHT069-SF-BG2	Northeastern portion of Chattanooga, Duncan Avenue	Reddish brown silt	0 to 4	10/24/2016	7, p. 6; 9, p. 1; 10, p. 182; 12, p. 19

Notes:

BG Background sample, Set 1 of the SI analyzed by the EPA Region 4 SESD Analytical Support Branch (Ref. 5, pp. 1, 2).
BG2 Background sample re-submitted with Set 2 SI samples for analysis under the EPA CLP. The samples were secured, kept under chain of custody, and met holding times for sample analysis (Refs. 11, p. B-3; 15, pp. 1, 5; 31).
bgs Below ground surface
CHT### Chattanooga Background Study grid number
CLP Contract Laboratory Program
EPA U.S. Environmental Protection Agency
ID Identification number
SESD Science and Ecosystem Support Division
SF Surface soil

Background Concentrations

The background soil samples listed in Table 3 of this HRS documentation record were collected in October 2016 during Set 1 of the EPA SI (Refs. 7, pp. 3, 4, 5, 6; 9, p. 1; 10, pp. 179, 180, 181, 182; 12, pp. 14, 19). The background soil samples were collected in October 2017, and analyzed two times, once during the October 2016 SI, Set 1 event, and again during the January 2017 SI, Set 2 event. The concentrations of lead presented in Table 3 of this HRS documentation record were used to establish background levels for AOC A (Refs. 5, pp. 6, 7, 8, 9; 15, pp. 75, 76, 77, 78). Background samples CHT040-SF-BG, CHT051-SF-BG, CHT055-SF-BG, and CHT069-SF-BG, as well as the SI, Set 1 samples, were analyzed in November 2016 by the EPA Region 4 SESD Analytical Support Branch (ASB) laboratory for lead using EPA Method 200.8 (Refs. 5, pp. 1, 14 through 17; 23, p. 94; 21). To ensure that analyses of the background soil samples collected in October 2017 were comparable to the SI, Set 2 (January 2017) contaminated samples, the background soil samples were analyzed a second time with the SI, Set 2 samples using the same analytical methods as the SI, Set 2 samples. Because lead is an environmentally stable metal, and the method of deposition at the site is the result of using foundry waste material as fill, it is not expected that lead levels at the background sample locations would vary significantly over the course of three months. The background samples were re-analyzed in February 2017 for lead, under the EPA Contract Laboratory Program (CLP) using the CLP Statement of Work (SOW) for Inorganic Superfund Methods, Multi-Media, Multi-Concentration, ISM02.3, which is the same method used for the SI, Set 2 (January 2017 event) soil samples (Refs. 15, pp. 1, 2, 75, 76, 77, 78; 16; 31). The re-analyzed background soil samples were re-labeled to add "2" to the end of the sample identification number, resulting in the sample identification numbers CHT040-SF-BG2, CHT051-SF-BG2, CHT055-SF-BG2, and CHT069-SF-BG2. Tetra Tech maintained custody of the background samples following their collection and analysis in October 2016 (Ref. 31). Based on the data qualifier report, holding times were not exceeded (Refs. 14, p. 7; 15, p. 7). The EPA Region 4 SESD, Office of Quality Assurance reviewed all data according to the analytical methods and EPA guidelines (Refs. 5, pp. 1, 2; 15, pp. 1, 2; 17; 23, p. 94). The minimum reporting limits (MRL) are analyte- and sample-specific and correspond to the lowest quantitative point on the calibration curve. The MRLs are adjusted for the amount of sample prepared and any dilutions performed, as well as for percent moisture (Refs. 5, p. 6; 15, p. 7; 18). The MRLs in the SESD ASB data package are equivalent to SQLs; and the MRLs in the CLP data package are equivalent to contract-required quantitation limits (CRQL) as defined in the HRS, Section 1.1, Definitions (Ref. 1, Section 1.1; 18).

TABLE 3: Analytical Results for Background Soil Samples

Sample ID	Hazardous Substance	Concentration (mg/kg)	MRL/ CRQL (mg/kg)	References
Set 1 – October 2016				
CHT040-SF-BG	Lead	41	4.0	5, p. 14
CHT051-SF-BG	Lead	47	4.0	5, p. 15
CHT055-SF-BG	Lead	60[1]	9.9	5, p. 16
CHT069-SF-BG	Lead	59	3.9	5, p. 17
Set 2 – January 2017				
CHT040-SF-BG2	Lead	39	0.45	15, p. 75
CHT051-SF-BG2	Lead	43	0.38	15, p. 76
CHT055-SF-BG2	Lead	59	0.46	15, p. 77
CHT069-SF-BG2	Lead	57	0.47	15, p. 78

Notes:

[1]	Lead at 60 mg/kg in sample CHT055-SF-BG was used as the background level because it is the highest lead concentration in the background samples.
BG	Background sample, Set 1 of the SI analyzed by the EPA Region 4 SESD Analytical Support Branch (Ref. 5, pp. 1, 2).
BG2	Background sample re-submitted with Set 2 SI samples for analysis under the EPA CLP. The samples were secured, kept under chain of custody, and met holding times for sample analysis (Refs. 11, p. B-3; 15, pp. 1, 5; 31).
CHT###	Chattanooga Background Study grid number
CLP	Contract Laboratory Program
CRQL	Contract-required quantitation limit
EPA	U.S. Environmental Protection Agency
ID	Identification number
J	The identification of the analyte is acceptable; the reported value is an estimate.
mg/kg	Milligrams per kilogram
MRL	Method reporting limit
SF	Surface soil

Contaminated Samples – EPA October 2016 Site Inspection, Set 1

The soil samples listed in Table 4 of this HRS documentation record were collected in October 2016 during the EPA SI (Refs. 7; 9). The samples were collected in accordance with the EPA-approved final SAP/QAPP dated October 21, 2016, for Set 1 of the SI (Refs. 7, p. 2; 8, pp. I, C-1). The soil samples listed below were collected from churches, a park, and residential properties in Cowart Place, Jefferson Heights, and Southside Gardens located within AOC A (Ref. 7) (specific pages are provided in Table 4 of this HRS documentation record). The soil samples consisted of 30-point composite samples from each individual property, collected at a depth of 0 to 4 inches bgs (Refs. 8, p. 7; 31). The contaminated soil samples were collected away from common sources of lead contamination, such as roads, driveways, and roof drain lines (Ref. 31). The contaminated soil samples were collected from similar soil types as the background soil samples (Refs. 7, pp. 3, 4, 5, 6, 16 through 112). The locations of the samples are depicted in Reference 32, pp. 34 through 36 (see also Figures 4 through 10 of this HRS documentation record). The field sample collection sheets and chain-of-custody records are provided in References 7 and 9 (specific pages for each sample are provided below).

TABLE 4: Set 1 Soil Sample Descriptions – October 2016

Sample ID	Sample Location	Physical Description	Depth (inches bgs)	Date Sampled	References
Cowart Place					
CP068-SF-EY	Williams Street	Dark brown silt	0 to 4	10/29/2016	7, p. 16; 9, p. 1
CP078-SF-FY	Cowart Street	Dark brown silt	0 to 4	10/29/2016	7, p. 19; 9, p. 2
Jefferson Heights					
JH018-SF-EY JH018-SF-EY-DUP	East 16th Street	Dark brown silt	0 to 4	10/25/2016	7, p. 23, 24; 9, pp. 6, 7
JH020-SF-EY	Washington and East 16th Streets	Dark brown silt	0 to 4	10/27/2016	7, p. 29; 9, p. 2
JH021-SF-EY	East 16th Street	Dark brown silt	0 to 4	10/27/2016	7, p. 31; 9, p. 7
JH033-SF-EY	Jefferson Street	Dark brown silt	0 to 4	10/26/2016	7, p. 36; 9, p. 7
JH036-SF-EY	East 16th Street	Dark brown silt	0 to 4	10/27/2016	7, p. 38; 9, p. 7
JH037-SF-EY	East 16th Street	Dark brown silt loam	0 to 4	10/29/2016	7, p. 39; 9, p. 3
JH038-SF-EY	East 16th Street	Dark brown silt	0 to 4	10/27/2016	7, p. 40; 9, p. 3
JH048-SF-EY	East 17th Street	Dark brown silt	0 to 4	10/29/2016	7, p. 44; 9, p. 3
JH049-SF-BY	East 17th Street	Dark brown silt	0 to 4	10/25/2016	7, p. 45; 9, p. 7
JH052-SF-EY	Jefferson Street	Dark brown silt	0 to 4	10/25/2016	7, p. 46; 9, p. 7
JH053-SF-EY	Jefferson Street	Dark brown silt	0 to 4	10/25/2016	7, p. 47; 9, p. 7

TABLE 4: Set 1 Soil Sample Descriptions – October 2016					
Sample ID	**Sample Location**	**Physical Description**	**Depth (inches bgs)**	**Date Sampled**	**References**
JH055-SF-EY	Jefferson Street	Dark brown silt	0 to 4	10/25/2016	7, p. 49; 9, p. 7
JH060-SF-EY JH060-SF-EY-DUP JH060-SF-GD	East 17th Street	Dark brown silt	0 to 4	10/26/2016	7, pp. 54, 55, 56; 9, p. 8
JH061-SF-EY	East 17th Street	Dark brown silt	0 to 4	10/26/2016	7, p. 58; 9, p. 8
JH062-SF-EY	East 17th Street	Dark brown silt	0 to 4	10/26/2016	7, p. 59; 9, p. 8
JH063-SF-EY	East 17th Street	Dark brown silt	0 to 4	10/26/2016	7, p. 60; 9, p. 8
JH064-SF-EY JH064-SF-EY-DUP	East 17th Street	Dark brown silt	0 to 4	10/27/2016	7, pp. 61, 62; 9, p. 8
JH097-SF-EY	Jefferson Street	Dark brown silt	0 to 4	10/27/2016	7, p. 68; 9, p. 3
JH109-SF-EY	East 18th Street	Reddish brown silt	0 to 4	10/27/2016	7, p. 71; 9, p. 4
JH167-SF-EY	Rossville Avenue	Dark brown silt	0 to 4	10/27/2016	7, p. 78; 9, p. 4
Southside Gardens					
SG002-SF-EY	Long Street	Dark brown silt	0 to 4	10/28/2016	7, p. 79; 9, p. 4
SG011-SF-EY	Cowart Street	Dark brown silt	0 to 4	10/28/2016	7, p. 80; 9, p. 4
SG012-SF-BY	Williams Street	Dark brown silt	0 to 4	10/28/2016	7, p. 81; 9, p. 4
SG021-SF-EY	West 26th Street	Dark brown silt	0 to 4	10/28/2016	7, p. 83; 9, p. 4
SG023-SF-BY	Long Street	Dark brown silt	0 to 4	10/28/2016	7, p. 84; 9, p. 4
SG023-SF-FY		Dark reddish brown silt			7, p. 85; 9, p. 5
SG024-SF-EY	Long Street	Dark brown silt	0 to 4	10/28/2016	7, p. 86; 9, p. 5
SG041-SF-EY SG041-SF-GD	Williams Street	Dark brown silt	0 to 4	10/28/2016	7, pp. 87, 88; 9, p. 5
SG060-SF-EY	Williams Street	Dark brown silt	0 to 4	10/29/2016	7, p. 89; 9, p. 5
SG064-SF-EY	Williams Street	Dark brown silt loam	0 to 4	10/28/2016	7, p. 90; 9, p. 5

TABLE 4: Set 1 Soil Sample Descriptions – October 2016					
Sample ID	**Sample Location**	**Physical Description**	**Depth (inches bgs)**	**Date Sampled**	**References**
SG065-SF-EY	Williams Street	Dark brown silt	0 to 4	10/28/2016	7, p. 91; 9, p. 5
SG080-SF-02	North Orchard Knob Avenue	Light brown silt	0 to 4	10/26/2016	7, p. 93; 9, p. 8
SG091-SF-FY	Long Street	Dark brown silt	0 to 4	10/29/2016	7, p. 96; 9, p. 5
SG110-SF-EY	Market Street	Dark brown silt	0 to 4	10/29/2016	7, p. 99; 9, p. 5
SG122-SF-EY	West 27th Street	Dark brown silt	0 to 4	10/29/2016	7, p. 111; 9, p. 6
SG123-SF-EY	West 27th Street	Dark brown silt	0 to 4	10/29/2016	7, p. 112; 9, p. 6

Notes:

###	Project-specific property number
bgs	Below ground surface
BY	Back yard
CP	Cowart Place
DUP	Duplicate
EY	Entire yard
FY	Front yard
GD	Garden
ID	Identification number
JH	Jefferson Heights
SF	Surface soil
SG	Southside Gardens

Contaminated Concentrations – EPA October 2016 Site Inspection, Set 1

The soil samples listed in Table 5 of this HRS documentation record were collected in October 2016 during Set 1 of the EPA SI (Refs. 7; 9). The soil samples were analyzed in November 2016 by the EPA Region 4 SESD ASB laboratory for lead using EPA Method 200.8 (Refs. 5, pp. 14 through 17; 23, p. 94). The EPA Region 4 SESD Office of Quality Assurance reviewed all data according to the analytical methods and EPA guidelines (Refs. 5, pp. 1, 2; 17; 23, p. 94). The MRLs are listed on the analytical data sheets in Reference 5. The MRLs are analyte- and sample-specific and correspond to the lowest quantitative point on the calibration curve and are adjusted for the amount of sample prepared and any dilutions performed, as well as for percent moisture (Refs. 5, p. 6; 18). The MRLs are equivalent to SQLs as defined in the HRS, Section 1.1, Definitions (Refs. 1, Section 1.1; 18).

TABLE 5: Analytical Results for Set 1 Soil Samples – October 2016

Sample ID	Hazardous Substance	Concentration (mg/kg)	MRL (mg/kg)	Reference
Cowart Place				
CP068-SF-EY	Lead	180	10	5, p. 18
CP078-SF-FY	Lead	360	9.8	5, p. 19
Jefferson Heights				
JH018-SF-EY	Lead	710	10	5, p. 22
JH018-SF-EY-DUP	Lead	630	9.9	5, p. 23
JH020-SF-EY	Lead	390	10	5, p. 28
JH021-SF-EY	Lead	330	9.9	5, p. 30
JH033-SF-EY	Lead	180	9.8	5, p. 35
JH036-SF-EY	Lead	730	10	5, p. 36
JH037-SF-EY	Lead	490	9.9	5, p. 37
JH038-SF-EY	Lead	700	20	5, p. 38
JH048-SF-EY	Lead	230	9.9	5, p. 41
JH049-SF-BY	Lead	540	20	5, p. 42
JH052-SF-EY	Lead	200	9.9	5, p. 43
JH053-SF-EY	Lead	210J[1] (210)	9.9	5, pp. 6, 44; 19
JH055-SF-EY	Lead	700	10	5, p. 45
JH060-SF-EY	Lead	500	10	5, p. 49
JH060-SF-EY-DUP	Lead	520J[2] (361.11)	9.9	5, pp. 6, 50; 19
JH060-SF-GD	Lead	360	10	5, p. 51
JH061-SF-EY	Lead	430	9.9	5, p. 53
JH062-SF-EY	Lead	270	10	5, p. 54
JH063-SF-EY	Lead	700	9.8	5, p. 55

TABLE 5: Analytical Results for Set 1 Soil Samples – October 2016				
Sample ID	**Hazardous Substance**	**Concentration (mg/kg)**	**MRL (mg/kg)**	**Reference**
JH064-SF-EY	Lead	590	10	5, p. 56
JH064-SF-EY-DUP	Lead	570	10	5, p. 57
JH097-SF-EY	Lead	620	10	5, p. 58
JH109-SF-EY	Lead	210	4.0	5, p. 61
JH167-SF-EY	Lead	740	9.9	5, p. 63
Southside Gardens				
SG002-SF-EY	Lead	920	20	5, p. 64
SG011-SF-EY	Lead	2,000	30	5, p. 65
SG012-SF-BY	Lead	430	10	5, p. 66
SG021-SF-EY	Lead	210	10	5, p. 67
SG023-SF-BY	Lead	400	10	5, p. 68
SG023-SF-FY	Lead	310	10	5, p. 69
SG024-SF-EY	Lead	660	20	5, p. 70
SG041-SF-EY	Lead	970	20	5, p. 71
SG041-SF-GD	Lead	1,200	20	5, p. 72
SG060-SF-EY	Lead	620	9.9	5, p. 73
SG064-SF-EY	Lead	380J[1] (380)	9.9	5, p. 74; 19
SG065-SF-EY	Lead	670	20	5, p. 75
SG080-SF-02	Lead	180	3.9	5, p. 76
SG091-SF-FY	Lead	540	9.9	5, p. 78
SG110-SF-EY	Lead	290	20	5, p. 80
SG122-SF-EY	Lead	240	10	5, p. 83
SG123-SF-EY	Lead	280J[1] (280)	10	5, p. 84; 19

Notes:

( ) Concentration was adjusted in accordance with References 19 and 20.

[1] Sample results should be considered estimated with a potential low bias (Ref. 19). The value presented parenthetically is the concentration obtained by applying EPA fact sheet *Using Qualified Data to Document and Observed Release and Observed Contamination* (November 1996) (Ref. 20, pp. 8, 18).

[2] Sample results should be considered estimated with a potential unknown bias (Ref. 19). The value presented parenthetically is the concentration obtained by applying EPA fact sheet *Using Qualified Data to Document and Observed Release and Observed Contamination* (November 1996) (Ref. 20, pp. 8, 18).

Project-specific property number
BY Back yard
CP Cowart Place
DUP Duplicate

EY	Entire yard
FY	Front yard
GD	Garden
ID	Identification number
J	Estimated value
JH	Jefferson Heights
mg/kg	Milligrams per kilogram
MRL	Minimum reporting limit
SF	Surface soil
SG	Southside Gardens

Contaminated Samples - EPA January 2017 Site Inspection, Set 2

The soil samples listed in Table 6 of this HRS documentation record, were collected in January 2017 during Set 2 of the EPA SI (Refs. 10; 12; 32, p. 8). The samples were collected in accordance with the EPA-approved final SAP/QAPP dated January 12, 2017 for Set 2 of the SI (Ref. 10, p. 2; 11, pp. I, C-1). The soil samples were collected from a park and residential properties in Alton Park, College Hill Courts, Cowart Place, Jefferson Heights, Mountain View Court, Richmond, and Southside Gardens located within AOC A (Refs. 10; 32, pp. 34 through 41). The soil samples consisted of 30-point composite samples collected at a depth of 0 to 4 inches bgs (Refs. 10, pp. 9 through 270; 11, p. 7). The contaminated soil samples were collected away from common sources of lead contamination, such as roads, driveways, and roof drain lines (Ref. 31). The contaminated soil samples were collected from similar soil types as the background soil samples (Refs. 10, pp. 9 through 270). The locations of the samples are depicted in Reference 32, pp. 34 to 41 (see also Figures 4 through 10 of this HRS documentation record). The field sample collection sheets and chain-of-custody records are provided in References 10 and 12 (specific pages for each sample are provided below).

TABLE 6: Set 2 Soil Sample Descriptions – January 2017

Sample ID	Sample Location	Physical Characteristics	Depth (inches bgs)	Date Sampled	References
Alton Park					
AP013-SF-BY	West 37th Street	Dark brown silt	0 to 4	1/17/2017	10, p. 9; 12, p. 2
AP014-SF-EYa AP014-SF-EYb AP014-SF-EYc AP014-SF-EY-DUP	West 37th Street	Dark brown silt loam	0 to 4	1/17/2017	10, pp. 11, 12, 13, 14; 12, Pp. 2, 3
AP025-SF-EY	Priola Street	Dark brown silt loam	0 to 4	1/23/2017	10, p. 19; 12, p. 3
AP027-SF-EYa AP027-SF-EYb AP027-SF-EYc AP027-SF-EY-DUP AP027-SF-EY-TRI	Priola Street	Dark brown silt	0 to 4	1/23/2017	10, pp. 21, 22, 23, 24, 25; 12, p. 3
AP052-SF-EY	West 38th Street	Dark brown silt loam	0 to 4	1/23/2017	10, p. 32; 12, p. 3
AP055-SF-EY	West 37th Street	Dark brown silt	0 to 4	1/23/2017	10, p. 33; 12, p. 4
AP085-SF-EY	Alton Park Blvd	Dark brown silt	0 to 4	1/24/2017	10, p. 35; 12, p. 14
AP116-SF-EY	West 39th Street	Dark brown silt	0 to 4	1/23/2017	10, p. 37; 12, p. 4
AP129-SF-EY	West 40th Street	Dark brown silt	0 to 4	1/24/2017	10, p. 38; 12, p. 14
AP146-SF-EY	Ohls Avenue	Dark brown silt	0 to 4	1/18/2017	10, p. 39; 12, p. 4
AP150-SF-SD	Ohls Avenue	Dark brown silt loam	0 to 4	1/18/2017	10, p. 40; 12, p. 4

TABLE 6: Set 2 Soil Sample Descriptions – January 2017					
Sample ID	**Sample Location**	**Physical Characteristics**	**Depth (inches bgs)**	**Date Sampled**	**References**
AP152-SF-EY	Ohls Avenue	Dark brown silt	0 to 4	1/18/2017	10, p. 41; 12, p. 4
AP154-SF-EY	Ohls Avenue	Dark brown silt loam	0 to 4	1/18/2017	10, p. 43; 12, p. 4
AP156-SF-EY	Ohls Avenue	Dark brown silt	0 to 4	1/18/2017	10, p. 44; 12, p. 4
AP160-SF-EY	Chandler Avenue	Dark brown silt loam	0 to 4	1/18/2017	10, p. 45; 12, p. 5
AP162-SF-EY AP162-SF-PG	Chandler Avenue	Dark brown silt	0 to 4	1/18/2017	10, pp. 46, 47; 12, p. 5
AP171-SF-EY	Chandler Avenue	Dark brown silt	0 to 4	1/18/2017	10, p. 48; 12, p. 5
AP173-SF-EY	Chandler Avenue	Dark brown silt	0 to 4	1/18/2017	10, p. 49; 12, p. 5
AP178-SF-EY	West 40th Street	Dark brown silt	0 to 4	1/24/2017	10, p. 50; 12, p. 14
AP189-SF-EY	West 42nd Street	Dark brown silt	0 to 4	1/24/2017	10, p. 51; 12, p. 14
AP196-SF-EY	Chandler Avenue	Dark brown silt	0 to 4	1/24/2017	10, p. 52; 12, p. 14
AP203-SF-EY	Chandler Avenue	Dark brown silt	0 to 4	1/24/2017	10, p. 54; 12, p. 14
AP204-SF-EY	Chandler Avenue	Dark brown silt	0 to 4	1/24/2017	10, p. 55; 12, p. 14
AP205-SF-EY	Chandler Avenue	Dark brown silt	0 to 4	1/24/2017	10, p. 56; 12, p. 14
AP210-SF-EY	Highland Avenue	Dark brown silt	0 to 4	1/24/2017	10, p. 57; 12, p. 15
AP220-SF-EY	Highland Avenue	Dark brown silt	0 to 4	1/24/2017	10, p. 58; 12, p. 15
AP222-SF-BY	Highland Avenue	Dark brown silt	0 to 4	1/24/2017	10, p. 59; 12, p. 15
AP226-SF-EY	Highland Avenue	Dark brown silt	0 to 4	1/24/2017	10, p. 60; 12, p. 15
AP229-SF-EY	Highland Avenue	Dark brown silt	0 to 4	1/25/2017	10, p. 61; 12, p. 15
AP230-SF-EY	Highland Avenue	Dark brown silt	0 to 4	1/24/2017	10, p. 62; 12, p. 15

TABLE 6: Set 2 Soil Sample Descriptions – January 2017					
Sample ID	**Sample Location**	**Physical Characteristics**	**Depth (inches bgs)**	**Date Sampled**	**References**
AP231-SF-EYa AP231-SF-EYb AP231-SF-EYc AP231-SF-EY-DUP AP231-SF-EY-TRI	Highland Avenue	Dark brown silt	0 to 4	1/24/2017	10, p. 64, 65, 66, 67, 68; 12, pp. 15, 16
AP238-SF-EY	Kirkland Avenue	Dark brown silt	0 to 4	1/25/2017	10, p. 70; 12, p. 16
AP249-SF-EY	Kirkland Avenue	Dark brown silt loam	0 to 4	1/18/2017	10, p. 71; 12, p. 5
AP258-SF-FY	Kirkland Avenue	Dark brown silt	0 to 4	1/18/2017	10, p. 73; 12, p. 5
AP259-SF-EY	Kirkland Avenue	Dark brown-black silt	0 to 4	1/18/2017	10, p. 74; 12, p. 5
AP266-SF-EY	Kirkland Avenue	Dark brown silt	0 to 4	1/18/2017	10, p. 75; 12, p. 5
AP270-SF-EY	Kirkland Avenue	Dark brown silt	0 to 4	1/25/2017	10, p. 77; 12, p. 16
AP273-SF-EY	Slayton Avenue	Dark brown-black silt	0 to 4	1/18/2017	10, p. 79; 12, p. 6
AP274-SF-EY	Hooker Avenue	Dark brown silt	0 to 4	1/18/2017	10, p. 80; 12, p. 6
AP275-SF-EY	Hooker Avenue	Dark brown silt	0 to 4	1/18/2017	10, p. 81; 12, p. 6
AP276-SF-EYa AP276-SF-EYb AP276-SF-EYc AP276-SF-DUP AP276-SF-TRI	Hooker Avenue	Dark brown silt	0 to 4	1/18/2017	10, p. 83, 84, 85, 86, 87; 12, p. 6
AP287-SF-EY	Hooker Avenue	Dark brown silt	0 to 4	1/18/2017	10, p. 91; 12, p. 6
AP290-SF-EY	Hooker Avenue	Dark brown silt	0 to 4	1/18/2017	10, p. 92; 12, p. 6
AP291-SF-EY	Hooker Avenue	Dark brown silt	0 to 4	1/18/2017	10, p. 93; 12, p. 7
AP297-SF-EY	Hughes Avenue	Dark brown silt	0 to 4	1/25/2017	10, p. 94; 12, p. 16
AP299-SF-EY	Hughes Avenue	Dark brown silt loam	0 to 4	1/20/2017	10, p. 95; 12, p. 7
AP300-SF-EYa AP300-SF-EYb AP300-SF-EYc AP300-SF-EY-DUP AP300-SF-EY-TRI	Hughes Avenue	Dark brown silt	0 to 4	1/25/2017	10, pp. 97, 98, 99, 100, 101; 12, pp. 16, 17

TABLE 6: Set 2 Soil Sample Descriptions – January 2017					
Sample ID	**Sample Location**	**Physical Characteristics**	**Depth (inches bgs)**	**Date Sampled**	**References**
AP301-SF-EY	Hughes Avenue	Dark brown silt	0 to 4	1/25/2017	10, p. 102; 12, p. 17
AP303-SF-EY	Central Avenue	Dark brown silt	0 to 4	1/25/2017	10, p. 103; 12, p. 17
AP343-SF-EY	Dorris Street	Dark brown silt	0 to 4	1/20/2017	10, p. 110; 12, p. 7
AP344-SF-EY	Dorris Street	Dark brown silt	0 to 4	1/20/2017	10, p. 111; 12, p. 7
AP350-SF-EY	Dorris Street	Dark brown silt	0 to 4	1/20/2017	10, p. 113; 12, p. 7
AP353-SF-EY	Dorris Street	Dark brown silt	0 to 4	1/20/2017	10, p. 114; 12, p. 7
AP362-SF-EY	Dorris Street	Dark reddish brown silty clay	0 to 4	1/20/2017	10, p. 116; 12, p. 7
AP375-SF-EY	Fagan Street	Dark brown silt	0 to 4	1/20/2017	10, p. 118; 12, p. 8
AP376-SF-EY	Fagan Street	Dark brown silt	0 to 4	1/20/2017	10, p. 120; 12, p. 8
AP392-SF-EY	Seminary Street	Dark brown silt loam	0 to 4	1/20/2017	10, p. 121; 12, p. 8
AP408-SF-EY	Fagan Street	Dark brown silt	0 to 4	1/20/2017	10, p. 122; 12, p. 8
AP412-SF-EY	Fagan Street	Dark brown silt	0 to 4	1/20/2017	10, p. 123; 12, p. 8
AP462-SF-EY	Fagan Street	Dark brown silt	0 to 4	1/20/2017	10, p. 128; 12, p. 9
AP491-SF-EY	Quinn Adams Street	Dark brown silty clay loam	0 to 4	1/20/2017	10, p. 130; 12, p. 9
AP495-SF-EY	Quinn Adams Street	Dark brown silt	0 to 4	1/20/2017	10, p. 132; 12, p. 9
AP512-SF-EY	Fagan Street	Dark brown silt	0 to 4	1/19/2017	10, p. 134; 12, p. 9
College Hill Courts					
CH001-SF-01a CH001-SF-01b CH001-SF-01c CH001-SF-01-DUP CH001-SF-01-TRI	Poplar Street	Dark brown silt	0 to 4	1/19/2017	10, p. 151, 152, 153, 154, 155; 12, p. 17
CH001-SF-03	Poplar Street	Dark brown silt	0 to 4	1/19/2017	10, p. 157; 12, p. 18

TABLE 6: Set 2 Soil Sample Descriptions – January 2017					
Sample ID	**Sample Location**	**Physical Characteristics**	**Depth (inches bgs)**	**Date Sampled**	**References**
CH001-SF-06	Poplar Street	Dark brown silt loam	0 to 4	1/19/2017	10, p. 160; 12, p. 18
CH001-SF-07	Poplar Street	Dark brown silt	0 to 4	1/19/2017	10, p. 161; 12, p. 18
CH001-SF-11	Poplar Street	Dark brown silt	0 to 4	1/19/2017	10, p. 165; 12, p. 18
CH001-SF-12	Poplar Street	Dark brown silt loam	0 to 4	1/19/2017	10, p. 167; 12, p. 18
CH001-SF-17	Poplar Street	Dark brown silt	0 to 4	1/19/2017	10, p. 172; 12, p. 19
CH001-SF-18	Poplar Street	Dark brown silt	0 to 4	1/19/2017	10, p. 173; 12, p. 19
Cowart Place					
CP145-SF-EY	Williams Street	Dark brown silt	0 to 4	1/17/2017	10, p. 194; 12, p. 10
CP159-SF-EY	West 21st Street	Dark brown silt loam	0 to 4	1/17/2017	10, p. 195; 12, p. 10
CP160-SF-EY	West 21st Street	Dark brown silt	0 to 4	1/17/2017	10, p. 196; 12, p. 10
Jefferson Heights					
JH015-SF-BY	East 16th Street	Dark brown silt	0 to 4	1/25/2017	10, p. 206; 12, p. 20
JH016-SF-EY	East 16th Street	Dark brown silt	0 to 4	1/25/2017	10, p. 207; 12, p. 20
JH017-SF-EY	East 16th Street	Dark brown silt	0 to 4	1/25/2017	10, p. 208; 12, p. 20
JH024-SF-EY	East 16th Street	Dark brown silt loam	0 to 4	1/25/2017	10, p. 209; 12, p. 20
JH031-SF-EY	Jefferson Street	Dark brown silt	0 to 4	1/25/2017	10, p. 212; 12, p. 20
JH039-SF-FY	East 16th Street	Dark brown silt	0 to 4	10/25/2016	7, p. 41; 12, p. 10
JH059-SF-BY	East 17th Street	Dark brown silt	0 to 4	1/17/2017	10, p. 215; 12, p. 10
JH069-SF-EY	East 17th Street	Dark brown silt loam	0 to 4	1/25/2017	10, p. 218; 12, p. 20
JH171-SF-BY JH171-SF-FY	Adams Street	Dark brown silty clay loam	0 to 4	1/25/2017	10, p. 228, 229; 12, p. 20

TABLE 6: Set 2 Soil Sample Descriptions – January 2017					
Sample ID	**Sample Location**	**Physical Characteristics**	**Depth (inches bgs)**	**Date Sampled**	**References**
Mountain View Court					
MT001-SF-01	St. Elmo Avenue	Dark brown silt	0 to 4	1/16/2017	10, p. 230; 12, p. 20
MT012-SF-EY-DUP	Mountain View Court	Dark brown silt	0 to 4	1/16/2017	10, p. 237; 12, p. 21
MT027-SF-EY	Mountain View Court	Dark brown silt	0 to 4	1/16/2017	10, p. 245; 12, p. 22
Richmond					
RH001-SF-EY	Delong Avenue	Dark brown silt	0 to 4	1/16/2017	10, p. 246; 12, p. 22
RH002-SF-EY	Delong Avenue	Dark brown silt	0 to 4	1/16/2017	10, p. 247; 12, p. 22
RH015-SF-EY	Delong Avenue	Dark brown silt	0 to 4	1/16/2017	10, p. 249; 12, p. 22
RH031-SF-EY	Tarlton Avenue	Dark brown silt	0 to 4	1/16/2017	10, p. 250; 12, p. 22
RH033-SF-EY	Tarlton Avenue	Dark brown silt	0 to 4	1/16/2017	10, p. 251; 12, p. 22
RH035-SF-FY	Tarlton Avenue	Dark brown silt	0 to 4	1/16/2017	10, p. 252; 12, p. 22
RH036-SF-EY	Tarlton Avenue	Dark brown silt	0 to 4	1/16/2017	10, p. 253; 12, p. 22
RH041-SF-EY	Tarlton Avenue	Dark brown silt	0 to 4	1/16/2017	10, p. 254; 12, p. 22
RH042-SF-EY	Tarlton Avenue	Dark brown silt	0 to 4	1/16/2017	10, p. 255; 12, p. 23
RH043-SF-EY	Tarlton Avenue	Dark brown silt	0 to 4	1/16/2017	10, p. 256; 12, p. 23
RH051-SF-EY	Tarlton Avenue	Dark reddish brown silt	0 to 4	1/25/2017	10, p. 258; 12, p. 23
RH052-SF-EY	Tarlton Avenue	Dark brown silt	0 to 4	1/16/2017	10, p. 259; 12, p. 23
RH054-SF-EY	Tarlton Avenue	Dark brown silt	0 to 4	1/16/2017	10, p. 260; 12, p. 23
Southside Gardens					
SG114-SF-EY	Carr Street	Dark brown silt loam	0 to 4	1/16/2027	10, p. 268; 12, p. 23
SG124-SF-EY	West 27th Street	Dark brown silt	0 to 4	1/17/2017	10, p. 269; 12, p. 11

Notes:

##	Grid number on property parcel
###	Project-specific property number
a,b,c	Subsampling triplicate
AP	Alton Park
bgs	Below ground surface
BY	Back yard
CH	College Hill Courts
CP	Cowart Place
DUP	Duplicate
EY	Entire yard
FY	Front yard
ID	Identification number
JH	Jefferson Heights
MT	Mountain View Court
PG	Playground
RH	Richmond
TRI	Triplicate sample
SD	Side yard
SF	Surface soil
SG	Southside Gardens

Contaminated Concentrations – EPA January 2017 Site Inspection, Set 2

The soil samples listed in Table 7 of this HRS documentation record were collected in January 2017 during Set 2 of the EPA SI (Refs. 10; 12). The samples were analyzed in February 2017 for lead under the EPA CLP using the CLP SOW ISM02.3 (Refs. 14, pp. 1, 2; 15, pp. 1, 3; 16). The EPA Region 4 SESD, Office of Quality Assurance reviewed all data according to the CLP SOW and EPA guidelines (Refs. 14, pp. 2, 3; 15, pp. 2, 3; 17). The MRLs are listed on the analytical data sheets in References 14 and 15. The MRLs are analyte- and sample-specific and correspond to the lowest quantitative point on the calibration curve. The MRLs are adjusted for the amount of sample prepared and any dilutions performed, as well as for percent moisture (Refs. 14, p. 7; 15, p. 7; 18). The MRLs are equivalent to CRQLs as defined in the HRS, Section 1.1, Definitions (Refs. 1, Section 1.1; 18).

TABLE 7: Analytical Results for Set 2 Soil Samples – January 2017

Sample ID	Hazardous Substance	Concentration (mg/kg)	CRQL (mg/kg)	Reference
Alton Park				
AP013-SF-BY	Lead	450	0.34	14, p. 13
AP014-SF-EYa	Lead	200	0.43	14, p. 14
AP014-SF-EYb	Lead	190	0.34	14, p. 15
AP014-SF-EYc	Lead	200	0.36	14, p. 16
AP014-SF-EY-DUP	Lead	190	0.48	14, p. 17
AP025-SF-EY	Lead	250	0.37	14, p. 20
AP027-SF-EYa	Lead	310	0.44	14, p. 21
AP027-SF-EYb	Lead	310	0.49	14, p. 22
AP027-SF-EYc	Lead	310	0.5	14, p. 23
AP027-SF-EY-DUP	Lead	280	0.46	14, p. 24
AP027-SF-EY-TRI	Lead	310	0.41	14, p. 25
AP052-SF-EY	Lead	240	0.4	14, p. 27
AP055-SF-EY	Lead	590	0.47	14, p. 28
AP085-SF-EY	Lead	280	0.41	15, p. 19
AP116-SF-EY	Lead	360	0.45	14, p. 31
AP129-SF-EY	Lead	740	0.41	15, p. 20
AP146-SF-EY	Lead	250	0.41	14, p. 32
AP150-SF-SD	Lead	240	0.42	14, p. 33
AP152-SF-EY	Lead	360	0.46	14, p. 34
AP154-SF-EY	Lead	380	0.41	14, p. 36
AP156-SF-EY	Lead	220	0.5	14, p. 37
AP160-SF-EY	Lead	250	0.48	14, p. 38

TABLE 7: Analytical Results for Set 2 Soil Samples – January 2017				
Sample ID	**Hazardous Substance**	**Concentration (mg/kg)**	**CRQL (mg/kg)**	**Reference**
AP162-SF-EY	Lead	220	0.45	14, p. 39
AP162-SF-PG	Lead	380	0.43	14, p. 40
AP171-SF-EY	Lead	280	0.49	14, p. 41
AP173-SF-EY	Lead	270	0.46	14, p. 42
AP178-SF-EY	Lead	830	0..48	15, p. 21
AP189-SF-EY	Lead	240	0.47	15, p. 22
AP196-SF-EY	Lead	360	0.41	15, p. 23
AP203-SF-EY	Lead	320	0..37	15, p. 24
AP204-SF-EY	Lead	280	0.3	15, p. 25
AP205-SF-EY	Lead	900	0.84	15, p. 26
AP210-SF-EY	Lead	220	0.41	15, p. 27
AP220-SF-EY	Lead	300	0.35	15, p. 28
AP222-SF-BY	Lead	400	0.42	15, p. 29
AP226-SF-EY	Lead	420	0.43	15, p. 30
AP229-SF-EY	Lead	380	0.47	15, p. 31
AP230-SF-EY	Lead	350	0.38	15, p. 32
AP231-SF-EYa	Lead	240	0.4	15, p. 33
AP231-SF-EYb	Lead	220	0.48	15, p. 34
AP231-SF-EYc	Lead	220	0.48	15, p. 35
AP231-SF-EY-DUP	Lead	210	0.48	15, p. 36
AP231-SF-EY-TRI	Lead	470	0.47	15, p. 37
AP238-SF-EY	Lead	360	0.48	15, p. 38
AP249-SF-EY	Lead	240	0.42	14, p. 43
AP258-SF-FY	Lead	350	0.43	14, p. 44
AP259-SF-EY	Lead	310	0.45	14, p. 45
AP266-SF-EY	Lead	230	0.42	14, p. 46
AP270-SF-EY	Lead	190	0.46	15, p. 39
AP273-SF-EY	Lead	280	0.39	14, p. 48
AP274-SF-EY	Lead	340	0.37	14, p. 49
AP275-SF-EY	Lead	270	0.37	14, p. 50

TABLE 7: Analytical Results for Set 2 Soil Samples – January 2017				
Sample ID	**Hazardous Substance**	**Concentration (mg/kg)**	**CRQL (mg/kg)**	**Reference**
AP276-SF-EYa	Lead	280	0.35	14, p. 51
AP276-SF-EYb	Lead	280	0.45	14, p. 52
AP276-SF-EYc	Lead	290	0.39	14, p. 53
AP276-SF-DUP	Lead	260	0.5	14, p. 54
AP276-SF-TRI	Lead	250	0.41	14, p. 55
AP287-SF-EY	Lead	190	0.38	14, p. 56
AP290-SF-EY	Lead	210	0.46	14, p. 57
AP291-SF-EY	Lead	300	0.5	14, p. 58
AP297-SF-EY	Lead	180	0.37	15, p. 43
AP299-SF-EY	Lead	240	0.34	14, p. 59
AP300-SF-EYa	Lead	340	0.46	15, p. 44
AP300-SF-EYb	Lead	300	0.38	15, p. 45
AP300-SF-EYc	Lead	340	0.42	15, p. 46
AP300-SF-EY-DUP	Lead	300	0.4	15, p. 47
AP300-SF-EY-TRI	Lead	360	0.38	15, p. 48
AP301-SF-EY	Lead	500	0.4	15, p. 49
AP303-SF-EY	Lead	360	0.39	15, p. 50
AP343-SF-EY	Lead	230	0.39	14, p. 62
AP344-SF-EY	Lead	210	0.4	14, p. 63
AP350-SF-EY	Lead	600	0.38	14, p. 64
AP353-SF-EY	Lead	300	0.4	14, p. 65
AP362-SF-EY	Lead	220	0.46	14, p. 66
AP375-SF-EY	Lead	180	0.44	14, p. 68
AP376-SF-EY	Lead	180	0.48	14, p. 70
AP392-SF-EY	Lead	330	0.45	14, p. 71
AP408-SF-EY	Lead	380	0.47	14, p. 72
AP412-SF-EY	Lead	250	0.48	14, p. 73
AP462-SF-EY	Lead	370	0.36	14, p. 78
AP491-SF-EY	Lead	240	0.37	14, p. 80

TABLE 7: Analytical Results for Set 2 Soil Samples – January 2017				
Sample ID	**Hazardous Substance**	**Concentration (mg/kg)**	**CRQL (mg/kg)**	**Reference**
AP495-SF-EY	Lead	280	0.39	14, p. 82
AP512-SF-EY	Lead	180	0.46	14, p. 84
College Hill Courts				
CH001-SF-01a	Lead	200	0.44	15, p. 51
CH001-SF-01b	Lead	220	0.44	15, p. 52
CH001-SF-01c	Lead	190	0.41	15, p. 53
CH001-SF-01-DUP	Lead	210	0.43	15, p. 54
CH001-SF-01-TRI	Lead	200	0.44	15, p. 55
CH001-SF-03	Lead	180	0.42	15, p. 57
CH001-SF-06	Lead	260	0.45	15, p. 60
CH001-SF-07	Lead	180	0.45	15, p. 61
CH001-SF-11	Lead	200	0.45	15, p. 65
CH001-SF-12	Lead	260	0.39	15, p. 66
CH001-SF-17	Lead	210	0.45	15, p. 70
CH001-SF-18	Lead	280	0.43	15, p. 71
Cowart Place				
CP145-SF-EY	Lead	580	0.39	14, p. 93
CP159-SF-EY	Lead	470J[1] (326.38)	0.49	14, pp. 7, 94; 19
CP160-SF-EY	Lead	340J[1] (236.11)	0.44	14, pp. 7, 95; 19
Jefferson Heights				
JH015-SF-BY	Lead	230	0.48	15, p. 79
JH016-SF-EY	Lead	250	0.46	15, p. 80
JH017-SF-EY	Lead	180	0.37	15, p. 81
JH024-SF-EY	Lead	210	0.38	15, p. 82
JH031-SF-EY	Lead	210	0.49	15, p. 83
JH039-SF-EY	Lead	1000J[1] (694.44)	2.1	14, pp. 7, 96; 19
JH059-SF-BY	Lead	390J[1] (270.83)	0.49	14, pp. 7, 97; 19
JH069-SF-EY	Lead	220	0.47	15, p. 85
JH171-SF-BY	Lead	800	0.5	15, p. 86
JH171-SF-FY	Lead	270	0.36	15, p. 87

TABLE 7: Analytical Results for Set 2 Soil Samples – January 2017				
Sample ID	**Hazardous Substance**	**Concentration (mg/kg)**	**CRQL (mg/kg)**	**Reference**
Mountain View Court				
MT001-SF-01	Lead	190	0.44	15, p. 88
MT012-SF-EY-DUP	Lead	190	0.42	15, p. 94
MT027-SF-EY	Lead	240	0.45	15, p. 99
Richmond				
RH001-SF-EY	Lead	270	0.44	15, p. 100
RH002-SF-EY	Lead	340	0.49	15, p. 101
RH015-SF-EY	Lead	460	0.46	15, p. 103
RH031-SF-EY	Lead	220	0.47	15, p. 104
RH033-SF-EY	Lead	240	0.42	15, p. 105
RH035-SF-FY	Lead	270	0.48	15, p. 106
RH036-SF-EY	Lead	200	0.49	15, p. 107
RH041-SF-EY	Lead	260	0.49	15, p. 108
RH042-SF-EY	Lead	180	0.48	15, p. 109
RH043-SF-EY	Lead	240	0.46	15, p. 110
RH051-SF-EY	Lead	190	0.49	15, p. 112
RH052-SF-EY	Lead	260	0.47	15, p. 113
RH054-SF-EY	Lead	380	0.44	15, p. 114
Southside Gardens				
SG114-SF-EY	Lead	190	0.37	15, p. 117
SG124-SF-EY	Lead	290J[1] (201.38)	0.47	14, pp. 7, 105; 19

Notes:

( ) Concentration was adjusted in accordance with References 19 and 20.

[1] Sample results should be considered estimated with a potential unknown bias (Ref. 19). The value presented parenthetically is the concentration obtained by applying EPA fact sheet *Using Qualified Data to Document and Observed Release and Observed Contamination* (November 1996) (Ref. 20, pp. 8, 18).

##	Grid number on property parcel	ID	Identification number
###	Project-specific property number	JH	Jefferson Heights
a,b,c	Subsampling triplicate	MT	Mountain View Court
AP	Alton Park	PG	Playground
bgs	Below ground surface	RH	Richmond
BY	Back yard	TRI	Triplicate sample
CH	College Hill Courts	SD	Side yard
CP	Cowart Place	SF	Surface soil
CRQL	Contract-required quantitation limit	SG	Southside Gardens
DUP	Duplicate		
EY	Entire yard		
FY	Front yard		

Attribution

The SCLS is composed of lead-contaminated soil on residential (single and multi-family) and non-residential (churches, parks, play areas, and vacant lots) properties, which show indications that foundry waste material was used as fill or top soil (Refs. 7, pp. 16 through 112; 10, pp. 3 through 182, 194 through 269; 24, p. 1; 31; 32, pp. 34 through 41, 45 through 56; 33; 35; 61; 67, pp. 4 through 16). The lead-contaminated soil is present above background levels and at Level II concentrations on residential and non-residential properties that comprise AOC A in Alton Park, College Hill Courts, Cowart Place, Jefferson Heights, Mountain View Court, Richmond, and Southside Gardens in the southwestern portion of Chattanooga (see Section 5.0.1, General Considerations and Figures 2 and 4 through 10 of this HRS documentation record) (Ref. 61).

Since the late 19th century, numerous foundries, typically brass, iron, and steel, have operated within the City of Chattanooga (Refs. 24; 25, p. 2; 36, p. 6; 43, p. 5; 44, p. 25; 45, p. 3; 48, p. 254). Most of these foundries were located between Broad Street and the Tennessee River in the southwestern portion of Chattanooga; along the western boundary of AOC A (Refs. 24; 36, p. 6; 61) (see Figure 2 of this HRS documentation record). The three most prominent foundries were Wheland (circa 1873), U.S. Pipe (circa 1882), and Ross-Meehan (circa 1889) (Refs. 24; 25, p. 2; 36, p. 6; 43, p. 5; 44, p. 25; 45, p. 3) (see Figure 2 of this HRS documentation record).

Ferrous (iron and steel) and non-ferrous (brass) foundries, like the ones mentioned above, specialize in melting and casting metal into desired shapes. Foundry products include parts for automobiles, train locomotives, and airplanes, fire hydrants, as well as plumbing fixtures and equipment components (Refs. 26, p. 1; 27, p. 13). Metal casting involves the creation of a mold into which molten metal is poured and cooled. The materials used to make the molds depend on the type of metal being cast and the desired shape of the final product. Sand is the most common molding material (Ref. 26, p. 1). Green sand molds are used in about 85 percent of foundries. Green sand is a mixture of sand, clay, carbonaceous materials, and water. The sand provides the structure for the mold, the clay binds the sand together, and the carbonaceous materials prevent rust. Water is used to activate the clay. The green sand mixture is packed around a pattern of the metal piece and allowed to harden. The mold is carefully removed from the pattern and prepared for the molten metal. Sand molds are used only once. After the molten metal has cooled, the sand mold is broken away from the metal piece in a process called shakeout (Ref. 26, p. 1). Most of the sand is reused to make future molds (Ref. 26, p. 1). Sand casting produces sand fines with reuse. These particles are too small to be effective in molds and have to be removed and often landfilled (Refs. 26, p. 4; 70, p. 42). Ferrous (iron and steel) and non-ferrous foundries (brass) may produce hazardous waste because of the lead, zinc, cadmium, and other metals present in the waste (Ref. 26, pp. 4, 5). The U.S. Pipe brass foundry used molten lead to seal brass and bronze valve housings (Ref. 48, p. 254). According to the 1995 Toxic Release Inventory data for ferrous and non-ferrous foundries, metallic wastes accounted for over 95 percent of the industry's releases and chromium, lead, manganese, and zinc accounted for over 95 percent of the on-site land disposal (Ref. 70, p. 55).

Until the advent of RCRA in the early 1970s, facilities discarded their used foundry waste material on their own properties, sent them to local landfills, or gave them away to be used as fill materials or as a top soil layer on other properties, including residential and non-residential properties that comprise the SCLS (Refs. 24, p. 1; 33; 54, p. 1). There are many properties in older industrial areas built on top of foundry waste material, which is generally an excellent fill material providing strong structural support (Ref. 54, p. 1). The U.S. Pipe plants and landfill are built on top of one to five feet of foundry waste material (Ref. 48, p. 51). This process came to a halt with the advent of RCRA (Ref. 54, p. 1). During an environmental investigation at an industrial property located at 1809 Chestnut Street, adjacent to the former Ross-Meehan foundry just west of AOC A, it was determined that about 6 to 8 feet of dark brown casting sand had been disposed of on the property. Furthermore, "spent" casting sand, dark brown sand, furnace slag, and building demolition debris were comingled with fill material on the property (Ref. 45, pp. 3, 23).

Since closure, Wheland, Ross-Meehan, and U.S. Pipe have enrolled in the TDEC Brownfields and VOAP and have conducted environmental investigations to address contamination at their properties (Refs. 45, pp. 1, 2; 51, pp. 4, 19; 53, p. 3; 72, pp .1, 3; 73, p. 1). In 2002, soil samples collected from the Wheland Middle Street Plant contained lead as high as 1,670 mg/kg, and soil samples collected at the Broad Street Plant contained lead as high as 1,720 mg/kg (Ref. 59, pp. 1, 8, 9). Soil samples collected from the Ross-Meehan property in 2002 contained lead as high as 10,400 mg/kg (Ref. 45, p. 54). Soil samples collected from the U.S. Pipe property in 2006 contained lead as high as 1,120 mg/kg (Ref. 51, p. 30). These concentrations of lead are above the EPA RML of 800 mg/kg for industrial soil (Refs. 55, p. 8; 56). During these investigations, fill, slag, metal fragments, fragments of iron, loose black sand fill, and foundry waste material were observed in the soil borings (Refs. 45, pp. 85, 99, 109, 110, 113, 115; 51, pp. 47 to 94; 53, pp. 16 to 18). During the 2016 and 2017 SI, four foundry waste material samples, USPIPE1-01, USPIPE2-01 from U.S. Pipe and WHELAND-01 and STELMO-SF-01 from the former Wheland Foundry and Wheland St. Elmo landfill were collected (Refs. 7, pp. 113, 114, 115; 10, p. 270; 33) (see Figure 11 of this HRS documentation record). Analytical results indicated the presence of lead at concentrations that ranged from 960 mg/kg to 3,900 mg/kg (Refs. 5, pp. 85 to 87; 15, p. 118; 32, p. 57).

Foundry waste material was used as fill or top soil on residential and non-residential properties within AOC A in southwestern Chattanooga (Refs. 24, p. 1; 33). Numerous sites are known by TDEC to contain as much as 20 or more feet of foundry waste material. Also, utility contractors in Chattanooga, as a standard operating procedure, contact the TDEC Division of Solid Waste Management for guidance when foundry waste material is encountered (Ref. 64, p. 5). Examples of foundry waste material deposition has been documented at the former McCallie Homes housing complex in the Alton Park area, in the St. Elmo area located adjacent to the Wheland St. Elmo landfill, on residential properties where EPA has conducted removal actions, and within AOC A (Refs. 24, p. 1; 37, pp, 4, 6; 65; 66, p. 4, 25; 67, pp. 1 to 16; 68). The former McCallie Homes housing complex is located adjacent to AOC A (Ref. 61) (see Figures 7A and 7B of this HRS documentation record). In the mid-1950s, foundry waste material was used at McCallie Homes under the footings of multi-unit buildings to level the ground before the building slabs were poured (Ref. 63, p. 3). From 1997 to 2002, the former McCallie Homes housing complex was demolished by the City of Chattanooga, and any foundry waste was covered with soil (Ref. 34, p. 1). Therefore, the McCallie Homes Housing complex is not included as part of AOC A; however, it does illustrate the extent of the use of foundry waste as fill or topsoil in the immediate vicinity of AOC A.

From June 26 to July 12, 2015, the City of Chattanooga advanced soil borings in the St. Elmo area, adjacent to the Wheland St. Elmo landfill, as part of a drainage improvement project. The St. Elmo drainage improvement project area is located about 410.7 feet south of the Mountain View Court area of AOC A (Ref. 68). The project involved the installation of a new drainage pipe to replace a partially collapsed portion of the drainage system that runs beneath the Wheland St. Elmo Landfill (Refs. 65; 66, pp. 4, 6, 25). Foundry waste material was observed up to 25 feet deep in some of the borings (Ref. 66, pp. 7, 28 to 81). Analytical results of samples collected from the soil borings showed lead concentrations up to 2,300 mg/kg (Ref. 66, pp. 18 to 21).

During the May 2011 removal assessment in the Read Avenue area of the SCLS, EPA collected composite surface soil samples at three residential properties along Read Avenue and an adjoining public park located at 1700 Mitchell Avenue (Refs. 37, p. 4; 40, p. 1). Analytical results of the samples showed lead concentrations up to 2,500 mg/kg (Ref. 37, pp. 6, 12, 15). According to SESD, the samples collected during the investigation were composed of a coarse black material, generally found beneath several inches of reddish clayey overburden. The material closely resembled foundry waste material, commonly associated with high lead concentrations at other sites (Ref. 37, p. 6). Subsequently in October 2011, EPA collected 32 surface soil samples during a removal assessment of 14 additional residential properties and two public rights-of-way in the Read Avenue area. Nine of the 32 soil samples showed lead concentrations equal to or above the EPA RAL of 400 mg/kg. Lead concentrations equal to or above the RAL ranged from 400 mg/kg to 930 mg/kg (Ref. 38, pp. 7, 13, 14, 16).

Based on the results of the May and October 2011 removal assessment, the historical presence of several foundries in the vicinity of the SCLS, and the proximity of other residential areas, EPA conducted a

site reconnaissance of 17 areas surrounding Read Avenue from June to August 2012. The reconnaissance was conducted to determine if heavy metals could be present (Ref. 39, p. 1). EPA conducted XRF screening of 235 soil samples in the following areas: Jefferson Heights (75 locations), West of Market Street (now Cowart Place) (25 locations), Westside Community (four locations), the former McCallie Homes (14 locations), Oak Hill (eight locations), Richmond (four locations), Alton Park (four locations), East Lake (20 locations), Ferger Place (17 locations), Oak Grove (eight locations), Highland Park (17 locations), Orchard Knob (four locations), Bushtown (20 locations), Ridgedale (three locations), Missionary Ridge (four locations), West of Rossville Boulevard (three locations), and St. Elmo (five locations) (Ref. 39, pp. 4 through 10, 16 through 25). Of the 235 soil screening locations, 31 contained lead at concentrations above its EPA RAL, and eight contained arsenic above its EPA RAL (Ref. 39, pp. 17 through 25). The highest concentration of lead (2,852 mg/kg) was detected in the Oak Grove area, located within 2 miles southeast of the Read Avenue area (Ref. 39, pp. 13, 14, 17 to 25). During the reconnaissance, dark brown/brown black soil with pieces of coal or slag was observed (Ref. 39, pp. 4, 5, 10

From September 24, 2012, through December 5, 2013, EPA conducted a time-critical removal action at properties I the Read Avenue area adjacent to the SCLS AOC to mitigate potential threats to human health and the environment (Ref. 41, p. 1). The removal encompassed Read Avenue, Mitchell Avenue, Underwood Street (formerly Carr Street), and intersecting streets (Ref. 41, p. 2). Yards that contained lead above the EPA RML, including the Read Avenue properties previously identified, were excavated until native clay was observed or a maximum depth of 1 foot was reached (Ref. 41, p. 4). During the removal action, approximately 8,222 tons of contaminated soil was removed from a total of 84 properties (81 residential properties and three church-owned properties) (Ref. 41, p. 11). The 84 properties addressed during the EPA 2012 to 2013 removal action are not included in Tables 4 through 7 of this HRS documentation record and are not included in the HRS score.

In October 2016 (Set 1) and January 2017 (Set 2), EPA conducted a SI at the SCLS (Ref. 32, pp. 5, 10). Set 1 of the SI focused on three residential areas in downtown Chattanooga, Tennessee: Southside Gardens, Jefferson Heights, and Cowart Place. Although sampling in these areas continued during Set 2 of the SI, Set 2 primarily focused on four additional residential areas: College Hill Courts, Richmond, Mountain View Court, and parts of Alton Park (Ref. 32, p. 10, 13) (see Figure 2 of this HRS documentation record). Of the 233 properties sampled during the SI, 135 residential, one park, and three church properties contained lead above background levels (Ref. 32, p. 25, 45 through 56). In addition, 41 of the 139 properties contained lead above the EPA RML of 400 mg/kg for lead in residential soil (Refs. 32, pp. 21 through 23, 34 to 41, 45 through 56; 55, p. 8).

Soil samples collected within AOC A during Sets 1 and 2 of the SI contained lead at concentrations up to 2,000 mg/kg in sample SG011-SF-EY (Refs. 5, pp. 7 to 84) (see also Tables 5 and 7 of this HRS documentation record). Several additional residential yards sampled during the SI contain lead at concentrations above 1,200 mg/kg, and are subject to an ongoing EPA removal action; as such, data for these properties are not included in Tables 4 through 7 of this HRS documentation record, nor are they included in the HRS score. Properties within AOC A show indications of foundry waste material having been used as fill material or top soil (Refs. 24; 33). On properties where fill mostly consists of foundry waste material, the fill is a dark brown, gray or black, course material that sometimes has slag and baghouse dust mixed in (Refs. 24; 67, pp. 1 through 16). The appearance of the soil samples collected from AOC A is characteristic of soil mixed with foundry waste material (Ref. 67, pp, 1 to 16). Foundry waste material is not continuous throughout individual properties or on all properties that comprise AOC A (Ref. 7, pp. 16 through 112; 10, pp. 3 through 178, 194 through 270; 24, p. 1). The use of foundry waste material on residential and non-residential properties is not uniform on individual or among adjacent properties (Refs. 24, p. 1; 33).

A review of the EPA SEMS database has revealed that the Tennessee Products NPL site (also known as Chattanooga Coke and Chemical Company and Southern Coke), located at 4800 Central Avenue, is within 1 mile of the current southern portion of the SCLS and AOC A (Ref. 57, pp. 1, 3, 5; 58, p. 6). The site included coal tar wastes that were disposed in Chattanooga Creek (Ref. 58, pp. 1, 4, 6).

Contaminants of concern are polycyclic aromatic hydrocarbons (PAH), metals, and pesticides; PAHs are the primary contaminants (Refs. 58, p. 6; 69, p. vi). EPA and TDEC have taken steps to clean up the site, and it does not pose a soil exposure threat to the public (Ref. 58, p. 1). Cleanup of the creek involved excavation, stabilization, treatment, recycling, and off-site disposal of contaminated sediments and stream restoration (Ref. 69, p. 17). An isolation barrier was placed in the creek channel (Ref. 69, pp. vii, 20). The second 5-year review of the selected remedy indicates that the isolation barrier is effectively isolating any residual source material remaining in the subsurface soil. Therefore, the remedy remains protective of human health and the environment (Ref. 69, p. vii) and Tennessee Products is not a suspected contributor to the lead levels in SCLS AOC A.

The hazardous substance listed below (lead) has been detected in shallow soils (less than 2 feet bgs) on residential, church (and after school program), vacant lots zoned for residential use, and park properties that comprise AOC A, indicating the likelihood of exposure to resident populations at residences or work places at the properties within AOC A (see also Tables 5 and 7 of this HRS documentation record for AOC A in Section 5.0.1 of this HRS documentation record).

Hazardous Substance in the Release

Lead

Area Hazardous Waste Quantity

2.4.2.1.1 Hazardous Constituent Quantity:

The total hazardous constituent quantity for AOC A could not be adequately determined according to the HRS requirements; that is, the total mass of all CERCLA hazardous substances in AOC A is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.1). Contaminant concentrations are not uniform throughout the AOC and insufficient historical and current data [manifests, potentially responsible party (PRP) records, State records, permits, waste concentration data, etc.] are available to adequately calculate the total or partial mass of all CERCLA hazardous substances associated with AOC A. Therefore, there is insufficient information to calculate a total or partial Hazardous Constituent Quantity estimate for AOC A with reasonable confidence. Scoring proceeds to the evaluation of Tier B, Hazardous Wastestream Quantity (Ref. 1, Section 2.4.2.1.1, Table 5-2).

Hazardous Constituent Quantity Assigned Value: NS
Hazardous Constituent Quantity Complete? No

2.4.2.1.2 Hazardous Wastestream Quantity:

The total hazardous wastestream quantity for AOC A could not be adequately determined according to the HRS requirements; that is, the total mass of all hazardous wastestreams and CERCLA pollutants and contaminants in AOC A is not known and cannot be estimated with reasonable confidence (Ref. 1, Section 2.4.2.1.2). Contaminant concentrations are not uniform throughout the AOC and insufficient historical and current data (manifests, PRP records, State records, permits, waste concentration data, annual reports, etc.) are available to adequately calculate the total mass of all hazardous wastestreams and CERCLA pollutants and contaminants in AOC A. Therefore, there is insufficient information to adequately calculate the total or partial mass of the wastestream in the AOC. Therefore, there is insufficient information to evaluate the hazardous wastestream quantity for AOC A with reasonable confidence. Scoring proceeds to the evaluation of Tier C, Volume (Ref. 1, Section 2.4.2.1.2, Table 5-2).

Hazardous Wastestream Quantity Assigned Value: NS

2.4.2.1.3 Volume:

The information available on the depth of AOC A is not sufficiently specific to support a volume of contaminated soil with reasonable confidence; therefore, it is not possible to assign a volume (Tier C) in cubic yards (yd^3) for Source No. 1 (Ref. 1, Section 2.4.2.1.3). Source No. 1 has been assigned a value of 0 for the volume measure (Ref. 1, Section 2.4.2.1.3). As a result, the evaluation of hazardous waste quantity proceeds to the evaluation of Tier D, Area (Ref. 1, Sec. 2.4.2.1.4, Table 5-2).

Volume Assigned Value: 0
Are the data complete for volume quantity for this area? No

2.4.2.1.4 Area:

The area of AOC A is not adequately determined. AOC A is composed of contaminated soil in one park, two vacant lots zoned as residential, three church properties (one of which is used as an after school program) and 125 (123 occupied and two unoccupied) residential properties that contain concentrations of lead that are equal to or greater than three times background levels (see Tables 5 and 7 of this HRS documentation record). The approximate area of observed contamination, excluding impervious surfaces, on each property was not estimated because of the large number of properties that comprise AOC A and unknown extent of impermeable surfaces within those properties. In addition, contamination is not inferred between sampling locations. However, the area is greater than 0 square feet (Ref. 32, pp. 34 to 41).

Sum (ft2): >0
Equation for Assigning Value (Ref. 1, Table 5-2): Area (A)/34,000

Area Assigned Value: >0

Area Hazardous Waste Quantity Value: >0

5.1 RESIDENT POPULATION THREAT

5.1.1 LIKELIHOOD OF EXPOSURE

Tables 4 and 6 of this HRS documentation record list surface soil samples (0 to 4 inches bgs) collected during Set 1 (October 2016) and Set 2 (January 2017) of the EPA SI and include three churches, one of which is used for an after-school program, and 123 occupied residential properties located within AOC A (Refs. 7, pp. 1 through 112; 10, pp. 9 through 270; 32, Appendix A, pp. A-4 through A-11). All surface soil samples listed in Tables 4 and 6 of this HRS documentation record were collected within the individual property boundaries and are part of AOC A; therefore, the distance of the population at each residence, church, and after-school program from the area of observed contamination is 0 feet (Refs. 7 and 10). Properties that were sampled and meet observed contamination, but contained an unoccupied residence (SG123 and SG124) or were vacant lots (JH061 and JH062) or parks (SG080) at the time of sampling, are not included as resident population threat targets (Refs. 7, pp. 58, 59, 93, 112; 10, p. 269; 28, pp. 1, 4, 5).

Resident Population Threat Likelihood of Exposure Factor Category Value: 550
(Ref. 1, Section 5.1.1)

5.1.2 WASTE CHARACTERISTICS

5.1.2.1 Toxicity

The toxicity values for the hazardous substances detected in the area of observed contamination samples are summarized in Table 8 of this HRS documentation record.

TABLE 8: Soil Exposure Toxicity		
Hazardous Substance	**Toxicity Factor Value**	**Reference**
Lead	10,000	2, p. 1

Lead is the only hazardous substance evaluated for this HRS documentation record. The toxicity factor value for lead is 10,000 (Refs. 1, Section 2.4.1.1; 1a, Section 2.4.1.1; 2, p. 1)

Toxicity Factor Value: 10,000
(Ref. 1, Section 5.1.2.1)

5.1.2.2 Hazardous Waste Quantity

TABLE 9: Hazardous Waste Quantity		
Area of Observed Contamination Letter	**Type**	**Area Hazardous Waste Quantity**
A	Contaminated Soil	Undetermined but greater than zero

The hazardous constituent quantity for AOC A is not adequately determined. AOC A is composed of contaminated soil on one park, two vacant lots zoned as residential, three church properties (one of which is used as an after school program) and 125 (123 occupied and two unoccupied) residential properties that contain elevated concentrations of lead (see Tables 5 and 7 of this HRS documentation record). The approximate area of observed contamination, excluding impervious surfaces, on each property was not estimated because of the large number of properties that comprise AOC A. Also, contamination was not inferred between sampling points. However, the area is greater than 0 square feet (Ref. 32, pp. 34 to 41). Per HRS Section 2.4.2.2, the hazardous waste quantity (HWQ) factor value is assigned a default factor value of 10 for the soil exposure component of the soil exposure and subsurface intrusion pathway (Ref. 1, Table 2-6).

Hazardous Waste Quantity Factor Value: 10
(Ref. 1, Sections 2.4.2.2 and 5.1.2.2)

5.1.2.3 Calculation of Waste Characteristics Factor Category Value

Only one hazardous substance was evaluated for the waste characteristics. Lead has a toxicity factor value of 10,000 (Ref. 2, p. 1). The waste characteristics factor category was obtained by multiplying the toxicity and HWQ factor values. Based on this product, a value was assigned in accordance with Reference 1, Table 2-7.

Toxicity Factor Value (see Table 8 of this HRS documentation record): 10,000
Hazardous Waste Quantity Factor Value: 10
Toxicity Factor Value ×
Hazardous Waste Quantity Factor Value: 1×10^5

Waste Characteristics Factor Category Value: 18
(Ref. 1, Table 2-7)

5.1.3 TARGETS

Only those individuals whose residence or workplace is both on the property of and within 200 feet of documented contamination that meet observed contamination criteria are included as resident population threat targets (Ref. 1, Section 5.1.3). Properties included in AOC A that contained an unoccupied residence (SG123 and SG124), vacant lots (JH061 and JH062), and parks (SG080) at the time of sampling were not evaluated as resident population threat targets (Refs. 7, pp. 58, 59, 81, 93, 112; 10, p. 269; 28, pp. 1, 4 5). Church properties without a school or daycare program (S012 and SG064/SG065) are included as workplaces and workers are evaluated (Refs. 7, pp. 81, 90, 91; 28, pp. 1, 4, 5; 30; 31). As a conservative measure of exposed targets, properties where removal actions have been conducted or are planned (JH019, JH023, JH041, and JH170), also are not evaluated as resident population targets (Refs. 35; 61) (see also Figures 1, 5, 7A, 7B of this HRS documentation record).

Level I Concentrations

Lead is the only hazardous substance scored in this HRS documentation record (see Tables 5 and 7 of this HRS documentation record). A cancer or non-cancer screening concentration cannot be calculated for lead (Ref. 2, p. 1). Therefore, Level I concentrations are not scored.

Level II Concentrations

Soil samples collected from one church property with an after-school program and 123 residential properties that are evaluated at Level II concentrations are listed in Tables 4 and 6 of this HRS documentation record (Refs. 5; 7; 10; 14; 15) (see also Figures 4 through 10 of this HRS documentation record). The soil samples consisted of 30-point composite samples collected from the front, back, and side yards, as well as from garden and playground areas on the properties (Refs. 7; 10). The residential soil samples were collected from 0 to 4 inches bgs on the each property and within 200 feet of the residences (Refs. 7; 10; 31). Samples were analyzed by the EPA Region 4 SESD ASB and under the EPA CLP, and data were reviewed by the EPA Region 4 SESD Office of Quality Assurance (Refs. 5, pp. 1, 3; 14, pp. 1, 2, 3; 15, pp. 1, 2, 3). The soil samples evaluated at Level II concentrations contain lead equal to or greater than three times background levels (see Tables 3, 5, and 7 of this HRS documentation record). As stated above, cancer and non-cancer screening concentrations cannot be calculated for lead (Ref. 2, p. 1).

5.1.3.1 Resident Individual

Area of Observed Contamination Letter: A
Level of Contamination (Level I/Level II): II

As presented in Tables 5 and 7 of this HRS documentation record, lead concentrations in all samples collected within AOC A from residential, churches, and the church property with the after-school program, meet the criteria for Level II concentrations (Refs. 2; 5; 7; 10; 14; 15) (see also Figures 4 through 10 of this HRS documentation record).

Resident Individual Factor Value: 45
(Ref. 1, Section 5.1.3.1)

5.1.3.2 Resident Population

The soil samples listed in Table 10 of this HRS documentation record were collected in January 2017 during Sets 1 and 2 of the EPA SI (Refs. 7; 9; 10; 12). The surface soil samples were collected from 0 to 4 inches bgs (Ref. 32, pp. 10, 13). Residential, worker, and school populations were obtained from the property owners while conducting site access and during public meetings, sampling activities, and site reconnaissance (Refs. 28, pp. 1 through 5; 30).

5.1.3.2.1 Level I Concentrations

Level I concentrations were not scored. Lead is the only hazardous substance scored in this HRS documentation record.

Level I Concentrations Factor Value: NS
(Ref. 1, Section 5.1.3.2.1)

5.1.3.2.2 Level II Concentrations

The soil samples listed in Tables 4 and 6 of this HRS documentation record were collected during Set 1 (October 2016) and Set 2 (January 2017) of the EPA SI (Refs. 7; 10) (specific page numbers are listed in Tables 4 and 6 of this HRS documentation record) (see also Figures 4 through 10 of this HRS documentation record). The churches (SG012, SG064/SG065), park (SG080), vacant lots (JH061, JH062), and properties that were unoccupied residences (SG123, SG124) at the time of sampling that are included in AOC A are not evaluated at Level II concentrations (Refs. 7, pp. 58, 59, 81, 90, 91, 93, 112; 10, p. 269; 28, pp. 1, 4, 5).

Level II Resident Population Targets

The soil samples listed in Table 10 of this HRS documentation record were collected during Set 1 (October 2016) and Set 2 (January 2017) of the EPA SI (Refs. 7; 10) (specific page numbers are listed below) (see also Figures 4 through 10 and Tables 4 and 6 of this HRS documentation record). The park (SG080), vacant lots (JH0061 and JH062), properties with unoccupied residences (SG123, SG124) at the time of sampling, as well as the two church properties (SG012, SG064/SG065) that are evaluated only as workplaces are not included as Level II resident population targets in Table 10 of this HRS documentation record (Refs. 7, pp. 58, 59, 81, 90, 91, 93, 112; 10, p. 269; 28, pp. 1, 4, 5). However, the church property used for an after-school program (AP297) is included in Table 10 of this HRS documentation record (Refs. 10, p. 94; 28, p. 3). Residential population was obtained from the residents while obtaining permission to access the properties for sampling or during sampling activities (Ref. 7; 10; 28, pp. 1, 2, 3, 4, 5) (specific page numbers for References 7 and 10 are provided below). The U.S. Census Bureau persons per household factor value of 2.48 for Hamilton County, Tennessee for years 2011 to 2015 was used for those discrete residences where the population was not obtained from the residents (Ref. 29, p. 1).

TABLE 10: Level II Resident Population Targets				
Area of Observed Contamination Letter	**Sample ID**	**No. of Residences**	**Total No. of Residents**	**References**
Alton Park				
A	AP013-SF-BY	1	2	10, p. 9; 28, p. 2
A	AP014-SF-EYa AP014-SF-EYb AP014-SF-EYc AP014-SF-EY-DUP	1	3	10, pp. 10, 11, 11, 13 ,14; 28, p. 2
A	AP025-SF-EY	1	2	10, p. 19; 28, p. 2
A	AP027-SF-EYa AP027-SF-EYb AP027-SF-EYc AP027-SF-EY-DUP AP027-SF-EY-TRI	1	2	10, p. 20, 21, 22, 23, 24; 28, p. 2
A	AP052-SF-EY	1	2	10, p. 32; 28, p. 2
A	AP055-SF-EY	1	4	10, p. 33; 28, p. 2
A	AP085-SF-EY	1	2.48	28, p. 2; 29
A	AP116-SF-EY	1	2	10, p. 37; 28, p. 2
A	AP129-SF-EY	1	1	10, p. 38; 28, p. 2
A	AP146-SF-EY	1	3	10, p. 39; 28, p. 2
A	AP150-SF-SD	1	2	10, p. 40; 28, p. 2
A	AP152-SF-EY	1	1	10, p. 41; 28, p. 2
A	AP154-SF-EY	1	2	10, p. 43; 28, p. 2
A	AP156-SF-EY	1	2	10, p. 44; 28, p. 2
A	AP160-SF-EY	1	3	10, p. 45; 28, p. 2
A	AP162-SF-EY AP162-SF-PG	1	5	10, pp. 46, 47; 28, p. 2
A	AP171-SF-EY	1	1	28, p. 2; 10, p. 48
A	AP173-SF-EY	1	2	10, p. 49; 28, p. 2
A	AP178-SF-EY	1	5	10, p. 50; 28, p. 2
A	AP189-SF-EY	1	2	10, p. 51; 28, p. 2
A	AP196-SF-EY	1	2	10, p. 52; 28, p. 2
A	AP203-SF-EY	1	1	10, p. 54; 28, p. 2
A	AP204-SF-EY	1	2	10, p. 55; 28, p. 2
A	AP205-SF-EY	1	1	10, p. 56; 28, p. 2
A	AP210-SF-EY	1	3	10, p. 57; 28, p. 2

TABLE 10: Level II Resident Population Targets				
Area of Observed Contamination Letter	**Sample ID**	**No. of Residences**	**Total No. of Residents**	**References**
A	AP220-SF-EY	1	2	10, p. 58; 28, p. 2
A	AP222-SF-BY	1	1	10, p. 59; 28, p. 2
A	AP226-SF-EY	1	6	10, p. 60; 28, p. 2
A	AP229-SF-EY	1	3	10, p. 61; 28, p. 2
A	AP230-SF-EY	1	4	10, p. 62; 28, p. 2
A	AP231-SF-EYa AP231-SF-EYb AP231-SF-EYc AP231-SF-EY-DUP AP231-SF-EY-TRI	1	2	10, pp. 64 through 68; 28, p. 2
A	AP238-SF-EY	1	4	10, p. 70; 28, p. 2
A	AP249-SF-EY	1	1	10, p. 71; 28, p. 2
A	AP258-SF-FY	1	2	10, p. 73; 28, p. 2
A	AP259-SF-EY	1	2.48	28, p. 2; 29
A	AP266-SF-EY	1	2	10, p. 75; 28, p. 2
A	AP270-SF-EY	1	3	10, p. 77; 28, p. 2
A	AP273-SF-EY	1	2	10, p. 79; 28, p. 2
A	AP274-SF-EY	1	5	10, p. 80; 28, p. 2
A	AP275-SF-EY	1	2	10, p. 81; 28, p. 2
A	AP276-SF-EYa AP276-SF-EYb AP276-SF-EYc AP276-SF-DUP AP276-SF-TRI	1	2	10, pp. 83 through 87; 28, p. 2
A	AP287-SF-EY	1	3	10, p. 91; 28, p. 2
A	AP290-SF-EY	1	1	28, p. 2; 10, p. 92
A	AP291-SF-EY	1	3	10, p. 93; 28, p. 3
A	AP297-SF-EY	NA	18	10, p. 94; 28, pp. 1, 3, 5
A	AP299-SF-EY	1	1	10, p. 95; 28, p. 3
A	AP300-SF-EYa AP300-SF-EYb AP300-SF-EYc AP300-SF-EY-DUP AP300-SF-EY-TRI	1	4	10, pp. 97 through 101; 28, p. 3

TABLE 10: Level II Resident Population Targets				
Area of Observed Contamination Letter	**Sample ID**	**No. of Residences**	**Total No. of Residents**	**References**
A	AP301-SF-EY	1	3	10, p. 102; 28, p. 3
A	AP303-SF-EY	1	1	10, p. 103; 28, p. 3
A	AP343-SF-EY	1	2	10, p. 110; 28, p. 3
A	AP344-SF-EY	1	1	10, p. 111; 28, p. 3
A	AP350-SF-EY	1	1	10, p. 113; 28, p. 3
A	AP353-SF-EY	1	2	10, p. 114; 28, p. 3
A	AP362-SF-EY	1	1	10, p. 116; 28, p. 3
A	AP375-SF-EY	1	2	10, p. 118; 28, p. 3
A	AP376-SF-EY	1	1	10, p. 120; 28, p. 3
A	AP392-SF-EY	1	2	10, p. 121; 28, p. 3
A	AP408-SF-EY	1	2	10, p. 122; 28, p. 3
A	AP412-SF-EY	1	10	10, p. 123; 28, p. 3
A	AP462-SF-EY	1	4	10, p. 128; 28, p. 3
A	AP491-SF-EY	1	4	10, p. 130; 28, p. 3
A	AP495-SF-EY	1	4	10, p. 132; 28, p. 3
A	AP512-SF-EY	1	2	10, p. 134; 28, p. 3
Cowart Place				
A	CP068-SF-EY	1	2.48	28, p. 3; 29
A	CP078-SF-FY	1	2.48	28, p. 3; 29
A	CP145-SF-EY	1	1	28, p. 3; 29
A	CP159-SF-EY	1	2.48	28, p. 3; 29
A	CP160-SF-EY	1	2.48	28, p. 3; 29
College Hill Courts				
A	CH001-SF-01a CH001-SF-01b CH001-SF-01c CH001-SF-01-DUP CH001-SF-01-TRI CH001-SF-03 CH001-SF-06 CH001-SF-07 CH001-SF-11 CH001-SF-12 CH001-SF-17 CH001-SF-18	380	684	28, pp. 3, 5; 30

TABLE 10: Level II Resident Population Targets				
Area of Observed Contamination Letter	**Sample ID**	**No. of Residences**	**Total No. of Residents**	**References**
Jefferson Heights				
A	JH015-SF-BY	1	3	10, p. 206; 28, p. 3
A	JH016-SF-EY	1	2	10, p. 207; 28, p. 3
A	JH017-SF-EY	1	3	10, p. 208; 28, p. 3
A	JH018-SF-EY JH018-SF-EY-DUP	1	2.48	7, pp. 23, 24; 29
A	JH020-SF-EY	8	19.84	7, p. 29; 28, p. 3; 29
A	JH021-SF-EY	1	2.48	28, p. 3; 29
A	JH024-SF-EY	1	4	10, p. 209; 28, p. 3
A	JH031-SF-EY	1	2	28, p. 3; 29
A	JH033-SF-EY	1	2.48	28, p. 3; 29
A	JH036-SF-EY	1	2.48	28, p. 3; 29
A	JH-037-SF-EY	1	2.48	28, p. 3; 29
A	JH038-SF-EY	1	1	7, p. 40; 28, p. 3
A	JH039-SF-EY	1	2.48	28, p. 3; 29
A	JH048-SF-EY	1	1	7, p. 44; 28, p. 3
A	JH049-SF-BY	1	2.48	7, p. 45; 28, p. 4; 29
A	JH052-SF-EY	1	2.48	7, p. 46; 28, p. 4; 29
A	JH053-SF-EY	1	2.48	7, p. 47; 28, p. 4; 29
A	JH055-SF-EY	1	4	7, p. 49; 28, p. 4
A	JH059-SF-BY	1	3	7, p. 53; 28, p. 4
A	JH060-SF-EY JH060-SF-EY-DUP JH060-SF-GD	1	1	7, pp. 54 to 56; 28, p. 4
A	JH063-SF-EY	1	2.48	7, p. 60; 28, p. 4; 29
A	JH064-SF-EY JH064-SF-EY-DUP	1	2	7, pp. 61, 62; 28, p. 4
A	JH069-SF-EY	1	3	10, p. 218; 28, p. 4
A	JH097-SF-EY	1	2.48	7, p. 68; 28, p. 4; 29
A	JH109-SF-EY	1	2	7, p. 71; 28, p. 4

TABLE 10: Level II Resident Population Targets				
Area of Observed Contamination Letter	**Sample ID**	**No. of Residences**	**Total No. of Residents**	**References**
A	JH167-SF-EY	1	1	7, p. 78; 28, p. 4
A	JH171-SF-BY JH171-SF-FY	1	2	10, pp. 228, 229; 28, p. 4
Mountain View Court				
A	MT001-SF-01	6	12	10, p. 230; 28, p. 4
A	MT012-SF-EY-DUP	1	3	10, p. 237; 28, p. 4
A	MT027-SF-EY	1	1	10, p. 245; 28, p. 4
Richmond				
A	RH001-SF-EY	1	4	10, p. 246; 28, p. 4
A	RH002-SF-EY	1	6	10, p. 247; 28, p. 4
A	RH015-SF-EY	1	1	10, p. 249; 28, p. 4
A	RH031-SF-EY	1	4	10, p. 250; 28, p. 4
A	RH033-SF-EY	1	4	10, p. 251; 28, p. 4
A	RH035-SF-FY	1	3	10, p. 252; 28, p. 4
A	RH036-SF-EY	1	2	10, p. 253; 28, p. 4
A	RH041-SF-EY	1	3	10, p. 254; 28, p. 4
A	RH042-SF-EY	1	2	10, p. 255; 28, p. 4
A	RH043-SF-EY	1	1	10, p. 256; 28, p. 4
A	RH051-SF-EY	1	2	10, p. 258; 28, p. 4
A	RH052-SF-EY	1	3	10, p. 259; 28, p. 4
A	RH054-SF-EY	1	4	10, p. 260; 28, p. 4
Southside Gardens				
A	SG002-SF-EY	1	2.48	28, p. 4
A	SG011-SF-EY	3	4	7, p. 80; 28, p. 4
A	SG021-SF-EY	1	2	7, p. 83; 28, p. 4
A	SG023-SF-BY SG023-SF-FY	6	8	7, pp. 84, 85; 28, p. 4
A	SG024-SF-EY	6	7	7, p. 86; 28, p. 4
A	SG041-SF-EY SG041-SF-GD	2	4.96	7, pp. 87, 88; 28, p. 4; 29
A	SG060-SF-EY	1	2.48	28, p. 4; 29
A	SG091-SF-FY	1	2.48	28, p. 5; 29

TABLE 10: Level II Resident Population Targets				
Area of Observed Contamination Letter	**Sample ID**	**No. of Residences**	**Total No. of Residents**	**References**
A	SG110-SF-EY	1	6	7, p. 99; 28, p. 5
A	SG114-SF-EY	8	13	10, p. 268; 28, p. 5
A	SG122-SF-EY	1	3	7, p. 111; 28, p. 5

Notes:

##	Grid number on property parcel
###	Project-specific property number
a,b,c	Subsampling triplicate
AP	Alton Park
BY	Back yard
CH	College Hill Courts
CP	Cowart Place
DUP	Duplicate
EY	Entire yard
FY	Front yard
GD	Garden
ID	Identification number
JH	Jefferson Heights
MT	Mountain View Court
NA	Not applicable; property is a playground area for an afterschool program (Ref. 28, p. 1)
PG	Playground
RH	Richmond
TRI	Triplicate sample
SD	Side yard
SF	Surface soil
SG	Southside Gardens

Sum of individuals subject to Level II concentrations: 1,059.4 persons (Refs. 28; 30).

Level II Concentrations Factor Value: 1,059.4 persons
(Ref. 1, Section 5.1.3.2.2)

5.1.3.3 Workers

Table 11 of this HRS documentation record identifies workers whose workplace area is on AOC A or within 200 feet of AOC A on the respective workplace property (Ref. 1, Section 5.1.3). During Set 1 of the SI (October 2016), surface soil samples SG012-SF-EY and SG064-SF-EY/SG065-SF-EY were collected from two church properties located on Williams Street within AOC A (Ref. 7, pp. 80, 90, 91). The number of regular workers at these churches was not available; therefore, they are not evaluated (Ref. 28, p. 1). During Set 2 of the SI (January 2017), surface soil sample AP297-SF-EY was collected from a church property that is used as a regular play area for a church after school program (Refs. 10, 94; 28, pp. 1, 2). Four people are regular employees for the after school program. Children who attend the after school program are evaluated as Level II Resident Population Targets and thus are not included in the Table 11 worker population (Ref. 28, p. 1).

TABLE 11: Workers

Area of Observed Contamination Letter	Sample Number	Location	No. of Workers	References
A	AP297-SF-EY	Westside Baptist Church after school program	4	10, p. 94; 28, pp. 1, 2

Total Number of Workers: 4 (Refs. 10, p. 94; 28, p. 1).

Workers Factor Value: 5
(Ref. 1, Table 5-4)

5.1.3.4 Resources

Description of Resource(s): No resources as stated in the HRS, Section 5.1.3.4, have been documented on AOC A.

Resources Factor Value: NS

5.1.3.5 Terrestrial Sensitive Environments

No terrestrial sensitive environments have been documented on AOC A.

Terrestrial Sensitive Environments Factor Value: NS

5.2 NEARBY POPULATION THREAT

The nearby population threat was not scored because the resident population threat is sufficient to qualify the site for the NPL. However, the nearby population threat is of concern to EPA and may be considered during a future evaluation (Ref. 1, Table 5-6). The EPA is continuing work in the SCLS area, which may include sampling of additional residential properties in the areas that comprise the SCLS. In May 2017, the EPA began a time-critical removal action in the Jefferson Heights area to address properties with lead concentrations at or above 1,200 mg/kg (Ref. 35). Properties that are part of the time-critical removal action are not scored in this HRS documentation record (Ref. 35).